

1449/1
Matematik
Kertas 1
Oktober 2021
 $1\frac{1}{2}$ jam



MODUL ULANGKAJI KECEMERLANGAN BERFOKUS SPM 2021
SET 2

MATEMATIK

Kertas 1
Satu jam tiga puluh minit

JANGAN BUKA MODUL INI SEHINGGA DIBERITAHU

1. *Modul ini mengandungi 40 soalan dalam dwibahasa.*
2. *Jawab semua soalan.*
3. *Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.*
4. *Satu senarai rumus disediakan di halaman 2 dan 3.*
5. *Anda dibenarkan menggunakan kalkulator saintifik.*

Modul ini mengandungi 25 halaman bercetak.

RUMUS MATEMATIK
MATHEMATICAL FORMULAE

Rumus-rumus berikut boleh membantu anda untuk menjawab soalan. Simbol-simbol yang diberi adalah yang biasa digunakan.
The following formulae may be helpful in answering the questions. The symbols given are the ones commonly used

PERKAITAN
RELATIONS

- | | |
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| <p>1 $a^m \times a^n = a^{m+n}$</p> <p>2 $a^m \div a^n = a^{m-n}$</p> <p>3 $(a^m)^n = a^{mn}$</p> <p>4 $A^{-1} = \frac{1}{ad-bc} \begin{pmatrix} d & -b \\ -c & a \end{pmatrix}$</p> <p>5 Jarak / Distance = $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$</p> <p>6 Titik Tengah / midpoint $(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$</p> <p>7 Purata laju = $\frac{\text{jarak yang dilalui}}{\text{masa yang diambil}}$
Average speed = $\frac{\text{distance travelled}}{\text{time taken}}$</p> <p>8 Min = $\frac{\text{hasil tambah nilai data}}{\text{bilangan data}}$
Mean = $\frac{\text{sum of data}}{\text{number of data}}$</p> <p>9 Min = $\frac{\text{hasil tambah (nilai titik tengah kelas} \times \text{kekerapan)}}{\text{hasil tambah kekerapan}}$
Mean = $\frac{\text{sum of (midpoint} \times \text{frequency)}}{\text{sum of frequencies}}$</p> <p>10 Varians / Variance, $\sigma^2 = \frac{\Sigma(x - \bar{x})^2}{N} = \frac{\Sigma x^2}{N} - \bar{x}^2$</p> <p>11 Varians / Variance, $\sigma^2 = \frac{\Sigma f(x - \bar{x})^2}{\Sigma f} = \frac{\Sigma f x^2}{\Sigma f} - \bar{x}^2$</p> <p>12 Sisihan piawai / Standard deviation, $\sigma = \sqrt{\frac{\Sigma(x - \bar{x})^2}{N}} = \sqrt{\frac{\Sigma x^2}{N} - \bar{x}^2}$</p> <p>13 Sisihan piawai / Standard deviation, $\sigma = \sqrt{\frac{\Sigma f(x - \bar{x})^2}{\Sigma f}} = \sqrt{\frac{\Sigma f x^2}{\Sigma f} - \bar{x}^2}$</p> | <p>14 Teorem Pithagoras / Pythagoras Theorem
$c^2 = a^2 + b^2$</p> <p>15 $P(A) = \frac{n(A)}{n(S)}$</p> <p>16 $P(A') = 1 - P(A)$</p> <p>17 $m = \frac{y_2 - y_1}{x_2 - x_1}$</p> <p>18 $m = -\frac{\text{pintasan-y}}{\text{pintasan-x}}$
$m = -\frac{\text{y-intercept}}{\text{x-intercept}}$</p> <p>19 Faedah mudah / Simple interest, $I = Prt$</p> <p>20 Nilai matang / Maturity value
$MV = P \left(1 + \frac{r}{n} \right)^{nt}$</p> <p>21 Jumlah bayaran balik / Total amount payable
$A = P + Prt$</p> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

BENTUK DAN RUANG
SHAPES AND SPACE

- 1 Luas trapezium = $\frac{1}{2} \times \text{hasil tambah dua sisi selari} \times \text{tinggi}$
Area of trapezium = $\frac{1}{2} \times \text{sum of parallel sides} \times \text{height}$
- 2 Lilitan bulatan = $\pi d = 2\pi r$
Circumference of circle = $\pi d = 2\pi r$
- 3 Luas bulatan = πr^2
Area of circle = πr^2
- 4 Luas permukaan melengkung silinder = $2\pi r h$
Curved surface area of cylinder = $2\pi r h$
- 5 Luas permukaan sfera = $4\pi r^2$
Surface area of sphere = $4\pi r^2$
- 6 Isipadu prisma tegak = Luas keratan rentas \times panjang
Volume of right prism = cross sectional area \times length
- 7 Isipadu silinder = $\pi r^2 h$
Volume of cylinder = $\pi r^2 h$
- 8 Isipadu kon = $\frac{1}{3} \pi r^2 h$
Volume of cone = $\frac{1}{3} \pi r^2 h$
- 9 Isipadu sfera = $\frac{4}{3} \pi r^3$
Volume of sphere = $\frac{4}{3} \pi r^3$
- 10 Isipadu piramid tegak = $\frac{1}{3} \times \text{luas tapak} \times \text{tinggi}$
Volume of right pyramid = $\frac{1}{3} \times \text{base area} \times \text{height}$
- 11 Hasil tambah sudut pedalaman poligon = $(n - 2) \times 180^\circ$
Sum of interior angles of a polygon = $(n - 2) \times 180^\circ$
- 12 $\frac{\text{panjang lengkok}}{\text{lilitan bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$
 $\frac{\text{arc length}}{\text{circumference of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$
- 13 $\frac{\text{luas sektor}}{\text{luas bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$
 $\frac{\text{area of sector}}{\text{area of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$
- 14 Faktor skala, $k = \frac{PA'}{PA}$
Scale factor, $k = \frac{PA'}{PA}$
- 15 Luas imej = $k^2 \times \text{luas objek}$
Area of image = $k^2 \times \text{area of object}$

Answer **all** questions.

Jawab semua soalan.

1. Apakah nilai digit bagi digit 2 dalam 2134_6 ?

What is the digit value of digit 2 in 2134_6 ?

- A 36
- B 432
- C 216
- D 48

2. Antara berikut, yang manakah benar?

Which of the following is true?

- A $53_{10} > 107_9$
- B $53_{10} > 110110_2$
- C $53_{10} > 53_8$
- D $53_{10} > 2100_3$

3. Bundarkan 0.0234567 betul kepada tiga angka bererti.

Round off 0.0234567 correct to three significant figures.

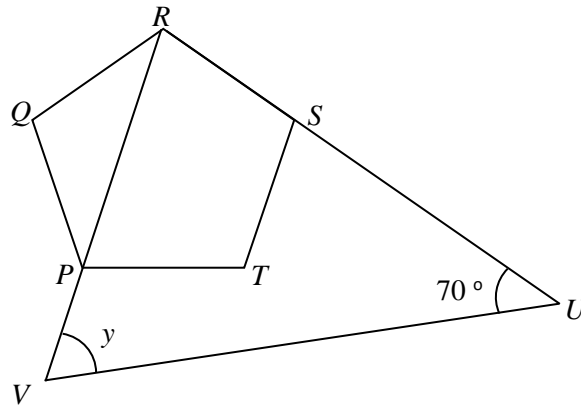
- A 0.023
- B 0.0230
- C 0.0234
- D 0.0235

4. Luas sebuah bendera Malaysia gergasi untuk perarakan kemerdekaan ialah $9.9 \times 10^3 \text{ m}^2$. Lebar bendera tersebut ialah 9000 cm. Hitung panjang, dalam cm, bendera tersebut.

The area of the giant Malaysia flag for the independence march is $9.9 \times 10^3 \text{ m}^2$. The width of the flag is 9000 cm. Calculate the length in, cm of the flag.

- A 1.1×10^3
- B 1.1×10^4
- C 1.1×10^5
- D 1.1×10^6

5. Dalam Rajah 1, $PQRST$ ialah sebuah pentagon sekata, RSU dan RPV ialah garis lurus.
In Diagram 1, $PQRST$ is a regular pentagon, RSU and RPV are straight lines.

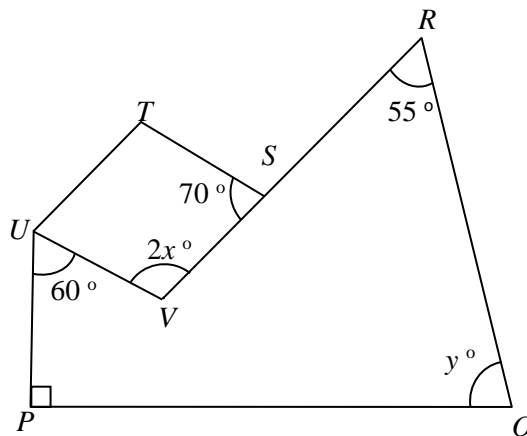


Rajah 1
 Diagram 1

Hitung nilai bagi y .
Calculate the value of y .

- A** 38
B 50
C 72
D 105

6. Dalam Rajah 2, $STUV$ ialah sebuah rombus dan RSV ialah garis lurus.
In Diagram 2, $STUV$ is a rhombus and RSV is a straight line.

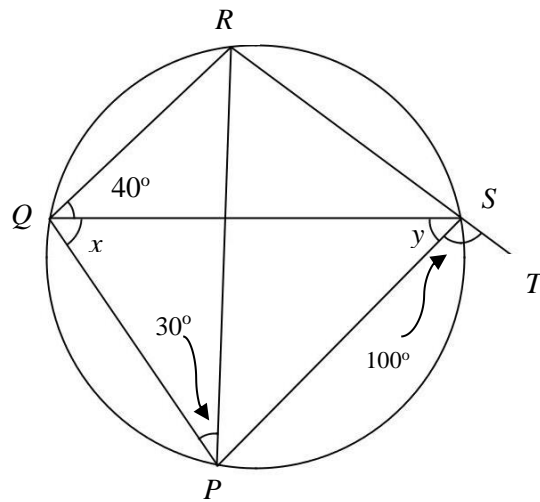


Rajah 2
 Diagram 2

Hitung nilai of $x + y$.
Calculate the value $x + y$.

- A** 115
B 130
C 135
D 140

7. Dalam rajah 3, RST ialah garis lurus.
In diagram 3, RST is a straight line.



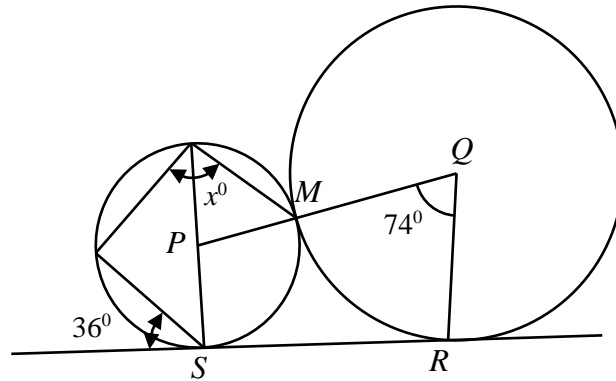
Rajah 3
 Diagram 3

Calculate the value of $x + y$
Hitung nilai bagi $x + y$

- A** 60
B 80
C 110
D 140

8. Rajah 4 menunjukkan dua bulatan dengan pusat P dan Q bersentuh di M . SR adalah tangen sepunya kepada kedua-dua bulatan masing-masing di S dan R .

Diagram 4 shows two circles with centres P and Q touching at M . SR is the common tangents to the circle at S and R respectively.



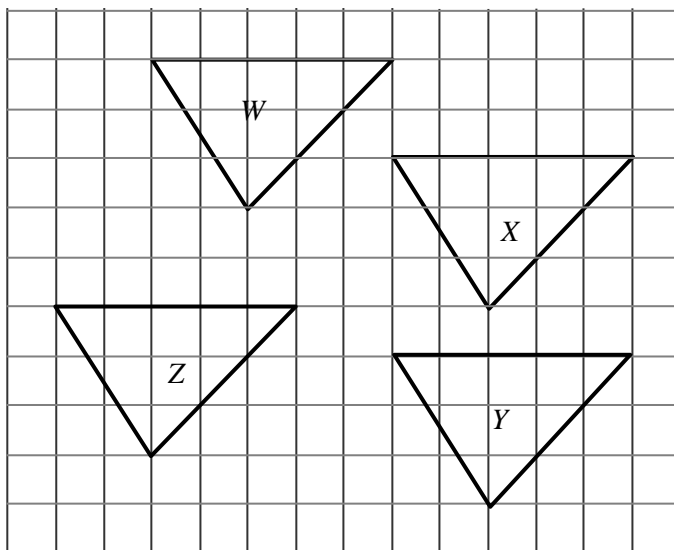
Rajah 4
Diagram 4

Cari nilai x .

Find the value of x .

- A** 72
- B** 81
- C** 89
- D** 110

9. Rajah 5 menunjukkan empat segitiga, W, X, Y dan Z, dilukis pada grid segiempat sama. *Diagram 5 shows four triangles, W, X, Y and Z, drawn on the square grids.*

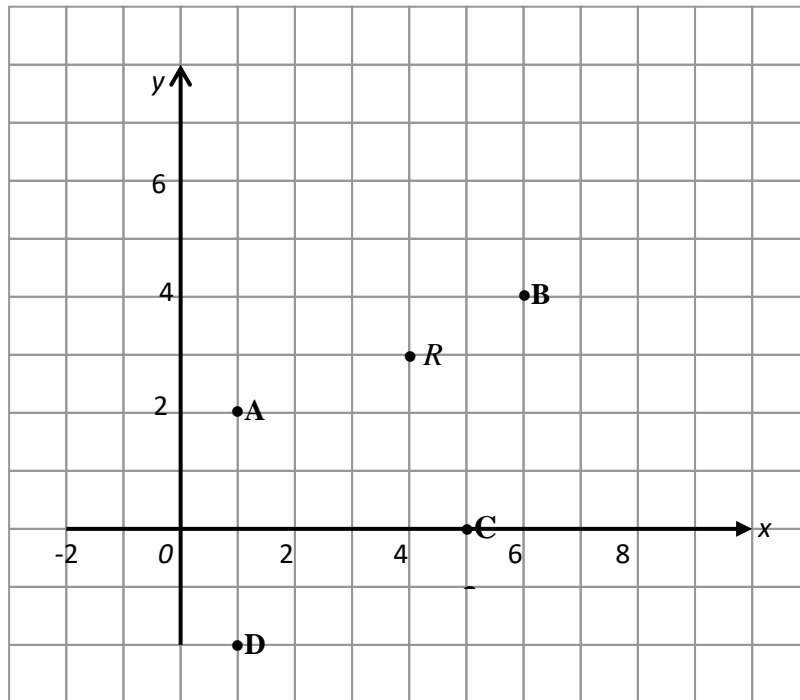


Rajah 5
Diagram 5

Antara yang berikut, yang manakah translasi yang betul?
Which of the following is the correct translation?

	Segitiga <i>Triangle</i>	Imej <i>Image</i>	Vektor translasi <i>Vector of translation</i>
A	W	X	$\begin{pmatrix} 5 \\ 2 \end{pmatrix}$
B	X	Y	$\begin{pmatrix} 0 \\ 4 \end{pmatrix}$
C	Y	Z	$\begin{pmatrix} -2 \\ 1 \end{pmatrix}$
D	Z	W	$\begin{pmatrix} 2 \\ 5 \end{pmatrix}$

10. Dalam Rajah 6, menunjukkan titik-titik yang di plot pada satah Cartes.
In the Diagram 6, shows points plotted on Cartesian plane.



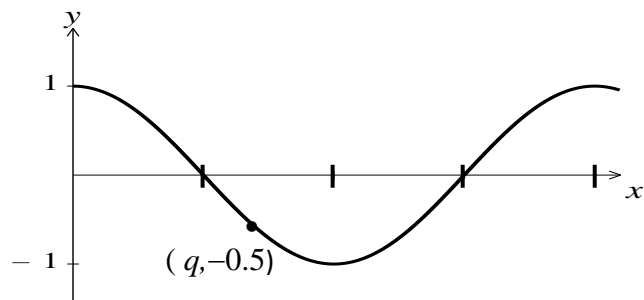
Rajah 6
Diagram 6

Tentukan samada titik **A**, **B**, **C** atau **D** merupakan imej bagi titik R di bawah putaran 90° lawan arah jam pada pusat (3,1).

*Determine which of the point, **A**, **B**, **C** or **D**, is the image of point R under a 90° anticlockwise rotation about the centre (3, 1).*

11. Rajah 7 menunjukkan graf $y = \cos x^\circ$.

Diagram 7 shows the graph of $y = \cos x^\circ$.



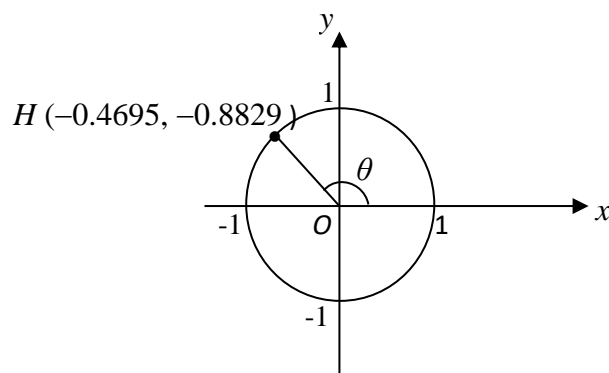
Rajah 7
Diagram 7

Cari nilai q .

Find the value of q .

- A** 90°
B 120°
C 150°
D 210°
12. Rajah 8, O ialah pusat bagi satu bulatan.

Diagram 8, O is the centre of a unit circle.



Rajah 8
Diagram 8

Cari nilai $\sin \theta$.

Find the value of $\sin \theta$.

- A** -0.8829
B -0.4695
C 0.8829
D 0.4695

13. Antara yang berikut, yang manakah merupakan kelemahan penggunaan kad kredit?
Which of the following is the weakness of using card credit?

- I. Mudah untuk pembelian atas talian
Easy to purchase online
- II. Boleh dikenakan faedah dan caj-caj.
May incur interest and charges
- III. Memberi tempoh bayar balik tanpa faedah.
Provide an interest-free repayment period.
- IV. Mudah berbelanja melebihi kemampuan.
Easy to shop beyond ability

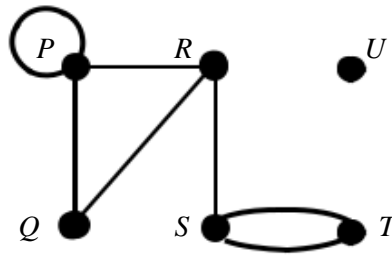
- A I dan / *and* II
- B I dan / *and* III
- C II dan / *and* III
- D II dan / *and* IV

14. Encik Malek menyimpan sebanyak RM6500 di sebuah bank dengan kadar faedah mudah 3.5% setahun. Hitung jumlah simpanan Encik Malek pada akhir tahun keempat.
Mr Malek deposits RM6500 in a bank which pays a simple interest rate of 3.5% per annum. Calculate the total savings of Mr Malek at the end of the fourth year.

- A RM 910
- B RM 6910
- C RM 7410
- D RM 15600

15. Rajah 9 menunjukkan sebuah graf.

Diagram 9 shows a graph.



Rajah 9
Diagram 9

Which of the following statement is true about the graph?

Antara pernyataan berikut, yang manakah benar mengenai graf itu?

- A** Graf ini ialah graf terarah.
This graph is a directed graph.
- B** Bilangan darjah bagi bucu Q ialah 3.
The degree of vertex Q is 3.
- C** Bilangan darjah graf itu ialah 13.
The sum of degree of the graph is 13.
- D** $V = \{P, Q, R, S, T, U\}$ dan / and $E = \{(P, P), (P, Q), (P, R), (R, Q), (R, S), (S, T), (S, T)\}$
16. Antara bilangan darjah berikut, yang manakah boleh dilukis sebagai satu graf?
Which of the following sum of degrees can be drawn as a graph?
- A** 2, 2, 2, 1, 4
- B** 2, 2, 3, 1, 4
- C** 3, 3, 2, 1, 4
- D** 3, 3, 4, 1, 2

17. Jadual 1 menunjukkan pendapatan bulanan Encik Muthu.

Table 1 shows Mr Muthu income in a month.

Gaji / Salary	RM 2810
Elaun / Allowance	RM 330
Sewa Diterima / Rental received	RM 510
Bonus / Bonus	RM 270

Jadual 1

Table 1

Hitung pendapatan aktif Encik Muthu.

Calculate active income of Mr. Muthu.

- A** RM 2810
- B** RM 3140
- C** RM 3410
- D** RM 3920

18. Jadual 2 menunjukkan pelan kewangan Encik Adam.

Table 2 shows Mr Adam's financial plan.

Pendapatan / Income	Pelan Kewangan / Financial plan (RM)	
Pendapatan bersih / <i>Net income</i>	3500	
Pendapatan pasif / <i>Passive income</i>	250	
Jumlah pendapatan bulanan / <i>Total monthly income</i>	3750	
Tolak simpanan dana kecemasan / <i>Minus emergency fund savings</i>	150	
Baki pendapatan / <i>Remaining income</i>	3600	

Perbelanjaan tetap bulanan / Monthly fixed expenses	Pelan Kewangan / Financial plan (RM)	
Pinjaman perumahan / <i>Housing loan</i>	750	
Pinjaman kereta / <i>Car loan</i>	450	
Perbelanjaan tetap bulanan / <i>Monthly fixed expenses</i>	1000	
Jumlah perbelanjaan tetap bulanan / <i>Total monthly fixed expenses</i>	2200	

Perbelanjaan tidak tetap bulanan / Irregular monthly expenses	Pelan Kewangan / Financial plan (RM)	
Makanan & Minuman / <i>Food & Drinks</i>	500	
Petrol / <i>Petrol</i>	200	
Bil telefon / <i>Phone bill</i>	200	
Bil utility / <i>Utility bill</i>	300	
Pelancongan / <i>Tourism</i>	200	
Jumlah perbelanjaan tidak tetap bulanan / <i>Total irregular monthly expenses</i>	1400	

Jadual 2

Table 2

Antara pernyataan yang berikut, yang manakah tidak benar?

Which of the following statements is not true?

- A** Tiada lebihan pendapatan bagi Encik Adam
There is no excess income for Mr Adam
- B** Encik Adam perlu kurangkan perbelanjaan bil telefon, bil utiliti dan pelancongan
Mr Adam needs to cut down on telephone bills, utility bills and tourism
- C** Encik Adam boleh membeli telefon baharu yang berharga RM3000
Mr Adam can buy a new phone worth RM3000
- D** Encik Adam perlu menambah pendapatan pasif beliau.
Mr. Adam needs to increase his passive income.

19. $3p(p - q) - (2p - q)^2 =$

- A $-p^2 + 7pq - q^2$
- B $-p^2 - 7pq + q^2$
- C $-p^2 - pq + q^2$
- D $-p^2 + pq - q^2$

20. Ungkapkan $\frac{2}{3n} - \frac{3-2n}{6n^2}$ sebagai satu pecahan tunggal dalam bentuk termudah.

Express $\frac{2}{3n} - \frac{3-2n}{6n^2}$ as a single fraction in its simplest form.

- A $-\frac{1}{n}$
- B $\frac{n-3}{n^2}$
- C $\frac{n-2}{2n^2}$
- D $\frac{2n-1}{2n^2}$

21. Diberi $6x - \frac{y}{2} = 2x - 3y$, ungkapkan x dalam sebutan y .

Given $6x - \frac{y}{2} = 2x - 3y$, express x in terms of y .

- A $x = -10y$
- B $x = -\frac{5}{2}y$
- C $x = -\frac{7}{8}y$
- D $x = -\frac{5}{8}y$

22. $\left(-\frac{r}{s}\right)k^{-2}$ boleh ditulis sebagai
 $\left(-\frac{r}{s}\right)k^{-2}$ can be written as

- A $-\frac{rk^2}{s}$
- B $-\frac{r}{sk^2}$
- C $-\frac{sk^2}{r}$
- D $-\frac{s}{rk^2}$

23. Ringkaskan yang berikut.

Simplify the following.

$$\frac{(27n^3)^{\frac{1}{3}} \times n^2 p^{-3}}{27p}$$

- A $\frac{n^3}{p^4}$
- B $\frac{n^5}{9p^4}$
- C $\frac{n^3}{9p^4}$
- D $\frac{n^5}{p^4}$

24. Remy telah menjalani pembedahan hidung dengan kos perubatan sebanyak RM 6800. Polisi insurans perubatan dan kesihatan yang diambil oleh Remy Ishak ialah seperti berikut.

Remy has undergone nose surgery with a medical cost of RM 6800. The medical and health insurance's policy taken by him is as following:

Deduktibel/ *Deductible*: RM 800

Ko-insurans / *co-insurance*: 60/40

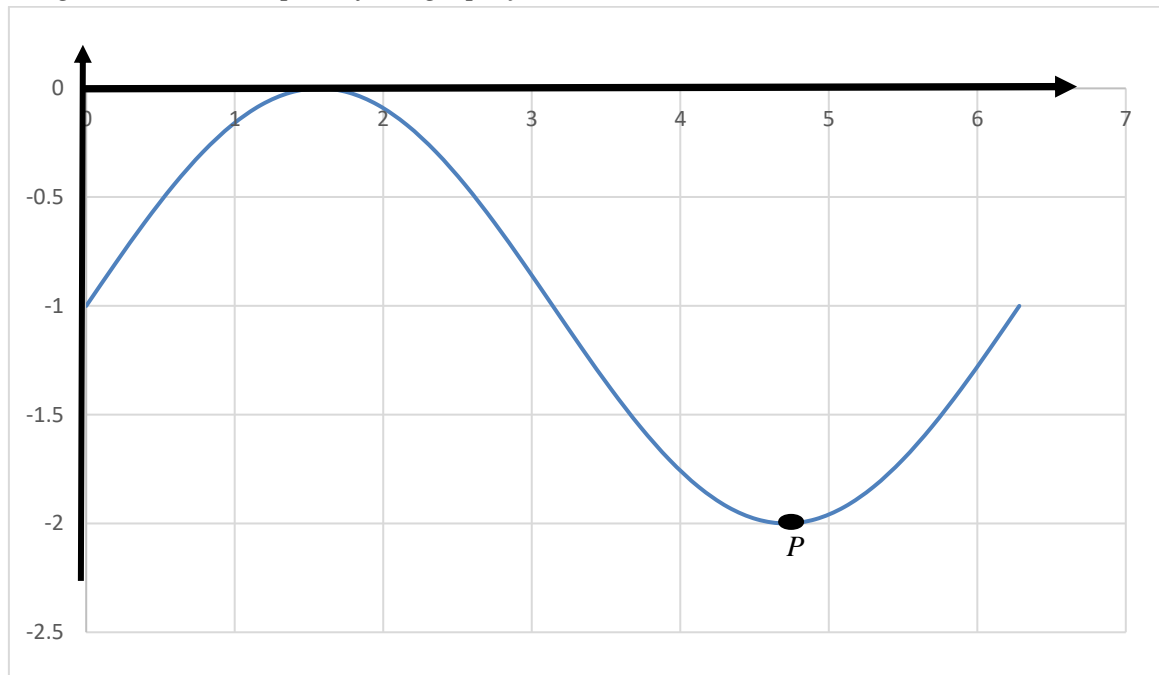
Berapakah wang yang perlu dibayar oleh Remy kepada pihak hospital?

How much money does Remy has to pay to the hospital?

- A RM 2400
- B RM 3200
- C RM 3600
- D RM 4400

25. Rajah 10 menunjukkan sebahagian dari graf $y = \sin x - 1$.

Diagram 10 shows a part of the graph $y = \sin x - 1$



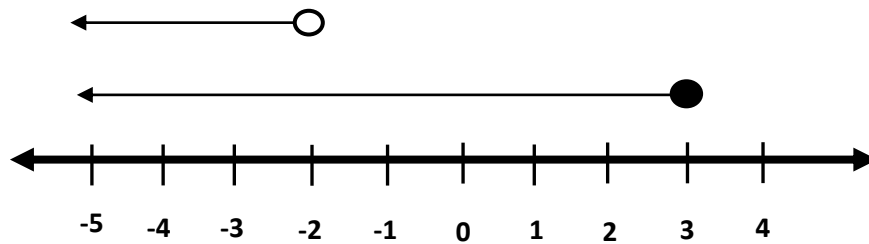
Rajah 10
Diagram 10

Koordinat P ialah
Coordinate of P is

- A** $(270^\circ, -2)$
- B** $(180^\circ, -2)$
- C** $(90^\circ, -2)$
- D** $(45^\circ, -2)$

26. Rajah 11 mewakili dua ketaksamaan linear serentak pada satu garis nombor.

Diagram 11 represents two simultaneous linear inequalities in a number line.



Rajah 11

Diagram 11

Antara yang berikut, yang manakah mewakili bahagian sepunya kedua-dua ketaksamaan itu?

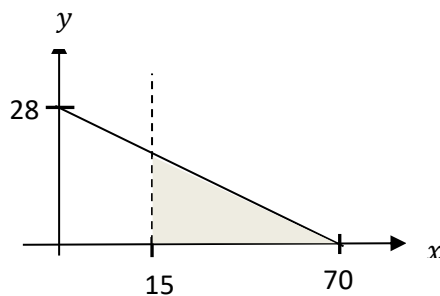
Which of the following inequality represents the common part of both the inequalities?

- A** $x \leq 3$
- B** $x < 3$
- C** $x \leq -2$
- D** $x < -2$

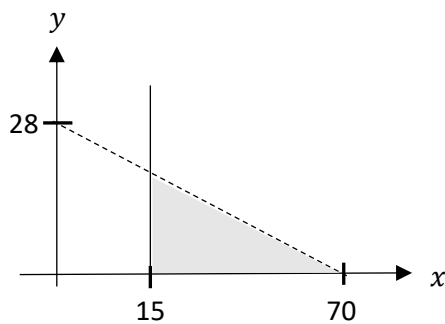
27. Puan Zaida menjual tudung dan telekung untuk mengumpul dana untuk disumbangkan kepada petugas barisan hadapan. Harga bagi sehelai tudung ialah RM 10 dan harga bagi sepasang telekung ialah RM 25. Puan Zaida perlu menjana sekurang-kurangnya RM 700. Puan Zaida tahu dia akan menjual lebih daripada 15 helai tudung. Antara kawasan berlorek berikut, yang manakah mewakili penyelesaian yang memuaskan situasi Puan Zaida itu?

Madam Zaida sells hijab and prayer rope to collect the fund for donation for the frontliner officers. The price for the hijab is RM 10 and the price for a pair of prayer rope is RM 25. Madam Zaida need to generate at least RM 700. Madam Zaida knows she will sell more than 15 pieces of hijab. Which of the following shaded region represent the solution that satisfies the Madam Zaida's situation?

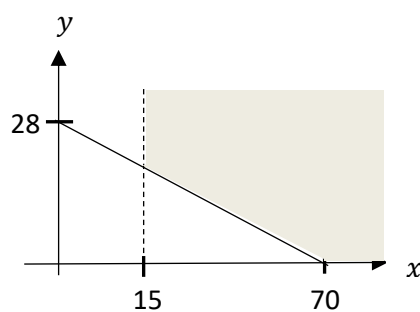
A



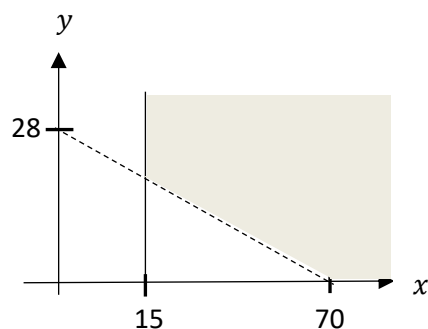
B



C

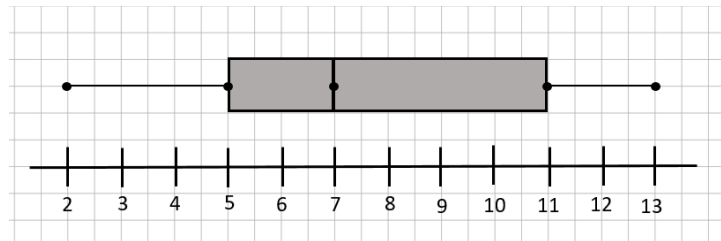


D



28. Rajah 12 menunjukkan plot kotak bagi masa kuarantin bagi 200 pesakit positif Covid-19 daerah Pasir Gudang.

Diagram 12 shows a box plot of quarantine duration for 200 positive Covid-19 patients at Pasir Gudang Johor.



Rajah 12

Diagram 12

Cari julat antara kuartil bagi masa kuarantin pesakit positif covid-19.

Find the interquartile range for the quarantine period for positive covid-19 patients.

- A 6 pesakit / patients
 - B 7 pesakit / patients
 - C 11 pesakit / patients
 - D 13 pesakit / patients
29. Julat bagi satu set nombor y , $3y$, $5y$, $7y$, $9y$ yang disusun secara menaik ialah 16. Cari nilai min bagi set nombor ini.
- Range for a set of number y , $3y$, $5y$, $7y$, $9y$ which in an ascending order is 16. Find the mean for this set of number.*

- A 2
- B 10
- C 10.4
- D 40

30. Antara berikut yang manakah **bukan** tujuan percukaian?

*Which of the following is **not** a purpose of taxation?*

- A Untuk membiayai projek pembangunan negara.
To finance the country's development projects.
- B Kawalan penjualan barangan atau perkhidmatan.
Control sales of good or services.
- C Alat kewangan untuk menstabilkan ekonomi.
Financial tool to stabilise the economy.
- D Mengurus perbelanjaan hidup, hutang dan komitmen sekiranya anda tidak mampu bekerja.
Managing living expenses debts and commitments in the event that you are unable to work.

31. Rediwan mempunyai jumlah pendapatan tahunan sebanyak RM 63 550 pada tahun 2020. Beliau telah mendermakan sebanyak RM 500 kepada rumah anak yatim yang telah diluluskan oleh kerajaan. Jadual 3 menunjukkan pelepasan cukai yang dituntutnya.

Rediwan has total annual income RM 63 550 for year 2020. He donates RM 500 to the orphanage home that government-approved. Table 3 shows the tax reliefs claimed by him.

Pelepasan cukai / Tax relief	Amaun / Amount (RM)
Individu / Individual	RM 8000
Insurans perubatan (had RM2000) <i>Medical insurance (limited to RM 2000)</i>	RM 2500
Insurans hayat dan KWSP (had RM 6500) <i>Life insurance and EPF (limited to RM6500)</i>	RM 4500

Jadual 3

Table 3

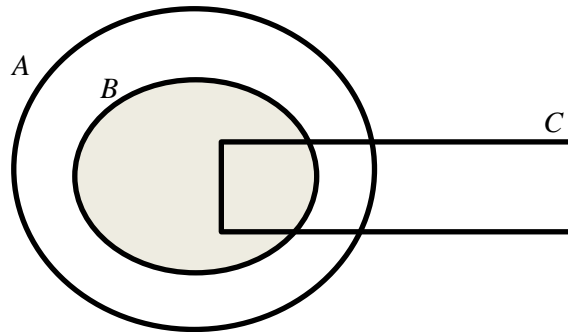
Hitung pendapatan bercukai bagi Rediwan

Calculate the chargeable income of Rediwan.

- A** RM 46550
- B** RM 48050
- C** RM 48550
- D** RM 49050

32. Rajah 13 ialah gambar rajah Venn yang menunjukkan hubungan antara set A , set B dan set C .

Diagram 13 is a Venn diagram that shows the relationship between set A , set B and set C .



Rajah 13

Diagram 13

Diberi bahawa set semesta $\xi = A \cup B \cup C$. Antara yang berikut yang manakah benar mewakili kawasan berlorek?

Given that the universal set $\xi = A \cup B \cup C$. Which of the following is true represents the shaded region?

- A** $(A \cup B) \cap C'$
- B** $(B \cap C) \cap A$
- C** $(A \cap B) \cap C'$
- D** $(B \cup C) \cap A$

33. Diberi bahawa:

$$\xi = \{x: 15 \leq x < 40\}$$

$$J = \{x : \text{gandaan } 5\}$$

$$K = \{x: \text{faktor bagi } 100\}$$

Given that:

$$\xi = \{x: 15 \leq x < 40\}$$

$$J = \{x : \text{multiple of } 5\}$$

$$K = \{x: \text{factor of } 100\}$$

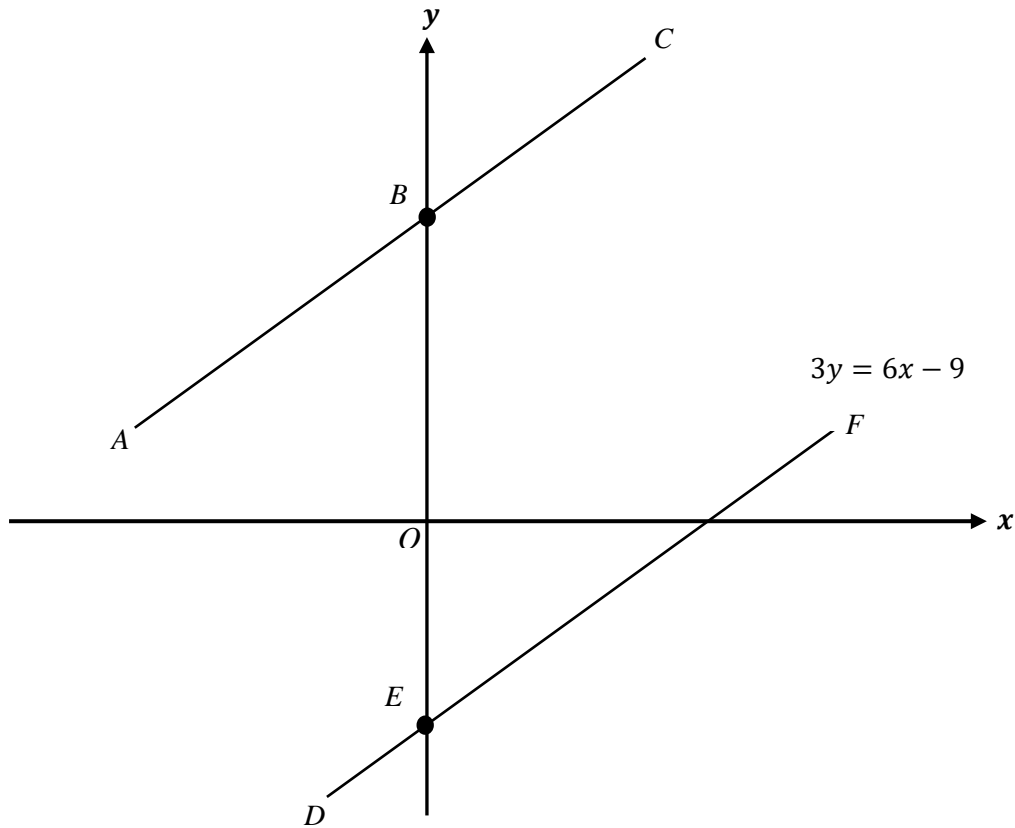
Tentukan nilai bagi $n(J \cap K)'$

Determine the value of $n(J \cap K)'$.

- A** 23
- B** 24
- C** 3
- D** 2

34. Rajah 14 menunjukkan dua garis lurus. Diberi bahawa garis ABC dan garis DEF adalah garis selari dan $OB : OE = 2 : 1$

Diagram 14 shows two straight lines. Given that straight lines ABC and DEF are parallel to each other and $OB : OE = 2:1$.

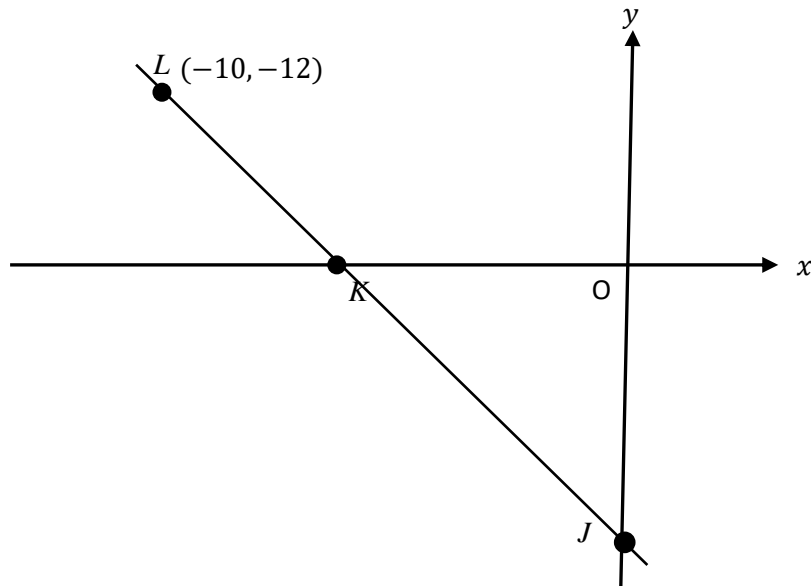


Rajah 14
Diagram 14

Cari persamaan bagi ABC
Find the equation for ABC

- A** $y = x + 6$
- B** $y = 3x + 6$
- C** $y = 2x + 3$
- D** $y = 2x + 6$

35. Rajah 15 menunjukkan garis lurus JKL di atas satu satah Cartes.
Diagram 15 shows a straight line JKL in a Cartesian plan.



Rajah 15
Diagram 15

Diberi $OJ : OK = 3 : 1$. Cari pintasan-y bagi garis lurus JKL .
Given $OJ : OK = 3 : 1$. Find the y-intercept for straight line JKL .

- A** -14
B -24
C -33
D -42
36. Sebanyak 7 dari 20 alat ujian pengesanan COVID-19 dalam sebuah kotak adalah didapati rosak. Dua alat ujian pengesanan COVID-19 di ambil secara rawak daripada kotak tersebut. Hitung kebarangkalian bahawa kedua-dua alat ujian pengesanan itu dalam keadaan elok.
7 out of 20 COVID-19 test kit in a box are damage. Two COVID-19 test kit are randomly chosen from the box. Calculate the probability of both of the test kits are in good condition.

- A** $\frac{39}{100}$
B $\frac{1}{20}$
C $\frac{39}{95}$
D $\frac{169}{400}$

37. Kebarangkalian Sadiqah untuk melanjutkan pelajaran ke United Kingdom dan Australia masing-masing adalah 0.71 dan 0.63. Apakah kebarangkalian bahawa Sadiqah akan dapat melanjutkan pelajaran ke salah satu negara?

Probability of Sadiqah to further her studies to United Kingdom and Australia are 0.71 and 0.63 respectively. What is the probability of her to further her studies in either one of the countries?

- A** 0.4454
B 0.4473
C 0.797
D 0.5527

38. Jadual 4 menunjukkan beberapa nilai bagi pembolehubah x dan y .

Table 4 shows some values of variables x and y

x	2	4
y	16	T

Jadual 4

Table 4

Diberi bahawa x berubah secara songsang dengan punca kuasa dua y . Hitung nilai T

Given that x varies inversely as square root of y . Calculate the value of T

- A** 64
B 4
C $\frac{1}{4}$
D $\frac{1}{64}$

39. Ketumpatan, ρ satu kontena berubah secara langsung dengan jisim, m dan secara songsang dengan isipadu, V . Diberi bahawa $\rho = 500 \text{ kgm}^{-3}$, $m = 100\text{kg}$ dan $V = 25\text{m}^3$. Hitung nilai jisim m apabila $\rho = 150 \text{ kgm}^{-3}$ dan $V = 50 \text{ m}^3$.

Density, ρ of a container varies directly as mass m and inversely as volume, V . Given that $\rho = 500 \text{ kgm}^{-3}$, $m = 100\text{kg}$ and $V = 25\text{m}^3$. Calculate the mass m when $\rho = 150 \text{ kgm}^{-3}$ and $V = 50 \text{ m}^3$.

- A** 375 kg
B 200 kg
C 60 kg
D 30 kg

40. $\begin{pmatrix} 2 & \frac{1}{3} \end{pmatrix} \begin{pmatrix} 0 & -4 \\ -6 & 9 \end{pmatrix} =$

A $\begin{pmatrix} -2 & -5 \end{pmatrix}$

B $\begin{pmatrix} 2 & 11 \end{pmatrix}$

C $\begin{pmatrix} 2 \\ -11 \end{pmatrix}$

D $\begin{pmatrix} -6 \\ -5 \end{pmatrix}$

QUESTION PAPER END
KERTAS SOALAN TAMAT



MODUL ULANGKAJI KECEMERLANGAN BERFOKUS 2021 SET 2

MATEMATIK Kertas 2 Dua jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Modul ini mengandungi tiga bahagian : **Bahagian A, Bahagian B dan Bahagian C.** Jawab semua soalan daripada **Bahagian A, Bahagian B dan satu soalan dalam Bahagian C.**
2. Jawapan hendaklah ditulis dengan jelas dalam ruang yang disediakan dalam modul. Tunjukkan langkah-langkah penting. Ini boleh membantu anda untuk mendapatkan markah.
3. Rajah yang mengiringi modul tidak dilukis mengikut skala kecuali dinyatakan.
4. Satu senarai rumus disediakan di halaman 2 & 3.
5. Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.

Pemeriksa			
Bahagian	Soalan	Markah Penuh	Markah Diperoleh
A (40m)	1	3	
	2	4	
	3	4	
	4	3	
	5	4	
	6	4	
	7	5	
	8	5	
	9	4	
	10	4	
B (45m)	11	7	
	12	10	
	13	9	
	14	9	
	15	10	
C (15m)	16	15	
	17	15	
Jumlah (100m)			

RUMUS MATEMATIK
MATHEMATICAL FORMULAE

Rumus-rumus berikut boleh membantu anda untuk menjawab soalan. Simbol-simbol yang diberi adalah yang biasa digunakan.
The following formulae may be helpful in answering the questions. The symbols given are the ones commonly used

PERKAITAN
RELATIONS

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1 $a^m \times a^n = a^{m+n}$</p> <p>2 $a^m \div a^n = a^{m-n}$</p> <p>3 $(a^m)^n = a^{mn}$</p> <p>4 $A^{-1} = \frac{1}{ad-bc} \begin{pmatrix} d & -b \\ -c & a \end{pmatrix}$</p> <p>5 Jarak / Distance = $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$</p> <p>Titik Tengah / midpoint</p> <p>6 $(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$</p> <p>Purata laju = $\frac{\text{jarak yang dilalui}}{\text{masa yang diambil}}$</p> <p>7 Average speed = $\frac{\text{distance travelled}}{\text{time taken}}$</p> <p>Min = $\frac{\text{hasil tambah nilai data}}{\text{bilangan data}}$</p> <p>8 Mean = $\frac{\text{sum of data}}{\text{number of data}}$</p> <p>9 Min = $\frac{\text{hasil tambah (nilai titik tengah kelas} \times \text{kekerapan)}}{\text{hasil tambah kekerapan}}$</p> <p>Mean = $\frac{\text{sum of (midpoint} \times \text{frequency)}}{\text{sum of frequencies}}$</p> <p>10 Varians / Variance, $\sigma^2 = \frac{\Sigma(x - \bar{x})^2}{N} = \frac{\Sigma x^2}{N} - \bar{x}^2$</p> <p>11 Varians / Variance, $\sigma^2 = \frac{\Sigma f(x - \bar{x})^2}{\Sigma f} = \frac{\Sigma fx^2}{\Sigma f} - \bar{x}^2$</p> <p>12 Sisihan piawai / Standard deviation, $\sigma = \sqrt{\frac{\Sigma(x - \bar{x})^2}{N}} = \sqrt{\frac{\Sigma x^2}{N} - \bar{x}^2}$</p> <p>13 Sisihan piawai / Standard deviation, $\sigma = \sqrt{\frac{\Sigma f(x - \bar{x})^2}{\Sigma f}} = \sqrt{\frac{\Sigma fx^2}{\Sigma f} - \bar{x}^2}$</p> | <p>14 Teorem Pithagoras/Pythagoras Theorem
$c^2 = a^2 + b^2$</p> <p>15 $P(A) = \frac{n(A)}{n(S)}$</p> <p>16 $P(A') = 1 - P(A)$</p> <p>17 $m = \frac{y_2 - y_1}{x_2 - x_1}$</p> <p>18 $m = -\frac{\text{pintasan-y}}{\text{pintasan-x}}$
$m = -\frac{\text{y-intercept}}{\text{x-intercept}}$</p> <p>19 Faedah mudah / Simple interest, $I = Prt$</p> <p>20 Nilai matang / Maturity value
$MV = P \left(1 + \frac{r}{n} \right)^{nt}$</p> <p>21 Jumlah bayaran balik / Total amount payable
$A = P + Prt$</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

BENTUK DAN RUANG SHAPES AND SPACE

- 1 Luas trapezium = $\frac{1}{2} \times \text{hasil tambah dua sisi selari} \times \text{tinggi}$
Area of trapezium = $\frac{1}{2} \times \text{sum of parallel sides} \times \text{height}$
- 2 Lilitan bulatan = $\pi d = 2\pi r$
Circumference of circle = $\pi d = 2\pi r$
- 3 Luas bulatan = πr^2
Area of circle = πr^2
- 4 Luas permukaan melengkung silinder = $2\pi r h$
Curved surface area of cylinder = $2\pi r h$
- 5 Luas permukaan sfera = $4\pi r^2$
Surface area of sphere = $4\pi r^2$
- 6 Isipadu prisma tegak = Luas keratan rentas \times panjang
Volume of right prism = cross sectional area \times length
- 7 Isipadu silinder = $\pi r^2 h$
Volume of cylinder = $\pi r^2 h$
- 8 Isipadu kon = $\frac{1}{3} \pi r^2 h$
Volume of cone = $\frac{1}{3} \pi r^2 h$
- 9 Isipadu sfera = $\frac{4}{3} \pi r^3$
Volume of sphere = $\frac{4}{3} \pi r^3$
- 10 Isipadu piramid tegak = $\frac{1}{3} \times \text{luas tapak} \times \text{tinggi}$
Volume of right pyramid = $\frac{1}{3} \times \text{base area} \times \text{height}$
- 11 Hasil tambah sudut pedalaman poligon = $(n - 2) \times 180^\circ$
Sum of interior angles of a polygon = $(n - 2) \times 180^\circ$
- 12 $\frac{\text{panjang lengkok}}{\text{lilitan bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$
 $\frac{\text{arc length}}{\text{circumference of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$
- 13 $\frac{\text{luas sektor}}{\text{luas bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$
 $\frac{\text{area of sector}}{\text{area of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$
- 14 Faktor skala, $k = \frac{PA'}{PA}$
Scale factor, $k = \frac{PA'}{PA}$
- 15 Luas imej = $k^2 \times \text{luas objek}$
Area of image = $k^2 \times \text{area of object}$

Section A

[40 markah]

[40marks]

Jawab **semua** soalan dalam bahagian ini.

Answer all questions in this section

1. Diberi $K = \{\text{nombor kuasa dua sempurna yang kurang daripada } 10\}$.

Given that $K = \{\text{perfect square numbers less than } 10\}$.

(a) Tulis semua subset yang mungkin bagi K .

Write all the subsets that are possible for K

(b) Jika $L = \{1, 2, 3, \dots, 10\}$, lukis sebuah gambar rajah Venn untuk mewakili hubungan antara K dan L

If $L = \{1, 2, 3, \dots, 10\}$, draw a Venn diagram to represent the relationship between K and L

[3 markah / 3 marks]

Jawapan/Answer:

(a)

(b)

2 .Puan Zalora seorang peniaga dalam talian. Dia menjual pelbagai jenis biskut antaranya ialah biskut chip coklat dan biskut badam. Dia mendapat hasil jualan sebanyak RM275 daripada 5 balang biskut chip coklat dan 8 balang biskut badam pada minggu pertama. Pada minggu kedua, dia menjual 9 balang biskut chip coklat dan 7 balang biskut badam dengan hasil jualan sebanyak RM310. Berapakah hasil jualan biskut chip coklat selama dua minggu .

Mrs. Zalora is an online seller. She sells various types of cookies including chocolate chip cookies and almond cookies. She got sales of RM275 from the sale of 5 jars of chocolate chip cookies and 8 jars of almond cookies in the first week. In the second week, she sold 9 jars of chocolate chip cookies and 7 jars of almond cookies with sales of RM310. What is the sales of chocolate chip cookies for two weeks.

[4 markah / 4 marks]

Jawapan/Answer:

3. Selesaikan persamaan kuadratik berikut:

Solve the following quadratic equation:

$$x + 1 = \frac{5x+5}{2x}$$

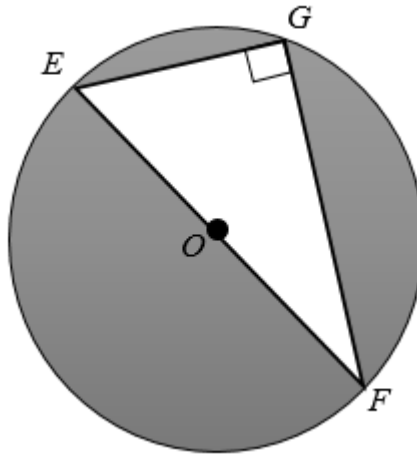
[4 markah / 4 marks]

Jawapan/Answer:

4. Rajah 1 di bawah menunjukkan sebuah bulatan berpusat O . Diberi $OF = 5$ cm dan $EG = 6$ cm. Hitung luas, dalam cm^2 , kawasan berlorek. Berikan jawapan dalam dua tempat perpuluhan.

Diagram 1 below shows a circle with centre O . Given that $OF = 5$ cm and $EG = 6$ cm. Calculate the area in cm^2 , of the shaded region. Give your answer in two decimal places.

(Guna / Use: $\pi = \frac{22}{7}$)



Rajah 1 / Diagram 1

[3 markah / 3 marks]

Jawapan/Answer:

5. Seorang pelukis ingin membuat lukisan penuh pada permukaan sebuah tembikar hiasan yang berbentuk silinder. Tembikar berbentuk silinder tersebut mempunyai ketinggian 10 cm dan jejari 3.5 cm. Jika satu tiub warna dapat menghasilkan lukisan seluas 100 cm², berapakah bilangan tiub warna yang diperlukan untuk membuat lukisan penuh pada 10 buah tembikar yang sama jenis?

A painter wants to make a full painting on the surface of a cylindrical-shaped decorative pottery. The cylindrical pottery has a height of 10 cm and a radius of 3.5 cm. If one colour tube can produce a drawing of 100 cm², how many colour tubes are needed to make a full drawing on 10 pieces of pottery of the same type?

(Guna / Use: $\pi = \frac{22}{7}$)

[4 markah / 4 marks]

Jawapan/Answer:

6. Dalam rajah 2, GH , HK dan KL ialah garis lurus. Titik H berada pada paksi- x .

GH selari dengan KL dan HK selari dengan paksi- y . Diberi bahawa persamaan GH ialah $2x + y = 6$.

In diagram 2, GH , HK and KL are straight lines. The point H is on the x -axis.

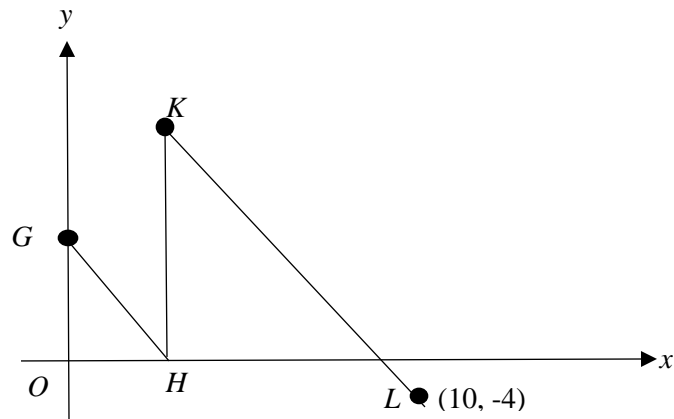
GH is parallel to KL and HK is parallel to the y -axis. Given that the equation of GH is $2x + y = 6$.

(a) Nyatakan persamaan garis lurus HK .

State the equation of straight line HK

(b) Tentukan persamaan garis lurus KL dan seterusnya nyatakan pintasan- x bagi KL .

Determine the equation of straight line KL and hence, state the x -intercept for KL



Rajah 2 / Diagram 2

[4 markah / 4 marks]

Jawapan/Answer:

(a)

(b)

7. (a) Tentukan sama ada pernyataan majmuk berikut adalah benar atau palsu

Determine whether the following compound statement is true or false

i) $8^{-1} = \frac{1}{8}$ dan 7 ialah faktor bagi 72
 $8^{-1} = \frac{1}{8}$ and 7 is a factor of 72

(b) Bina dua implikasi yang sesuai bagi pernyataan berikut:

Construct two implications for the following statement:

20% daripada 30 ialah 6 jika dan hanya jika $0.2 \times 30 = 6$
20% from 30 is 6 if and only if $0.2 \times 30 = 6$

(c) Buat satu kesimpulan umum secara aruhan bagi urutan nombor 12, 24, 44, 72..... yang mengikut pola berikut:

Make a general conclusion by induction for the sequence of numbers 12, 24, 44, 72, which follows the following pattern:

$$12 = 4(1^2) + 8$$

$$24 = 4(2^2) + 8$$

$$44 = 4(3^2) + 8$$

$$72 = 4(4^2) + 8$$

.....

[5 markah / 5 marks]

Jawapan/Answer:

(a) i) _____

(b) Implikasi 1: _____

Implication 1: _____

Implikasi 2: _____

Implication 2: _____

(c) Kesimpulan / Conclusion: _____

8. Jadual 1 menunjukkan bilangan guli yang berwarna di dalam dua buah balang yang berbeza.

The table 1 shows the number of colored marbles in two different jars.

	Guli merah <i>Red marble</i>	Guli putih <i>White marble</i>
Balang A <i>Jar A</i>	x	3
Balang B <i>Jar B</i>	4	8

Jadual 1 / Table 1

- (a) Sebiji guli dipilih secara rawak daripada balang yang berbeza. Cari nilai x , jika kebarangkalian kedua-dua guli yang dipilih adalah warna yang berbeza daripada balang yang berbeza ialah $\frac{13}{24}$.

A marble is select at random from a jar. Find the value of x , if the probability that the two marbles selected are different colors from different jars is $\frac{13}{24}$.

- (b) Dua biji guli dipilih secara rawak daripada balang yang berbeza. Cari kebarangkalian sekurang-kurangnya sebiji guli berwarna merah dipilih.

Two marbles are randomly selected from different jars. Find the probability of at least one red marble is selected.

[5 markah / 5 marks]

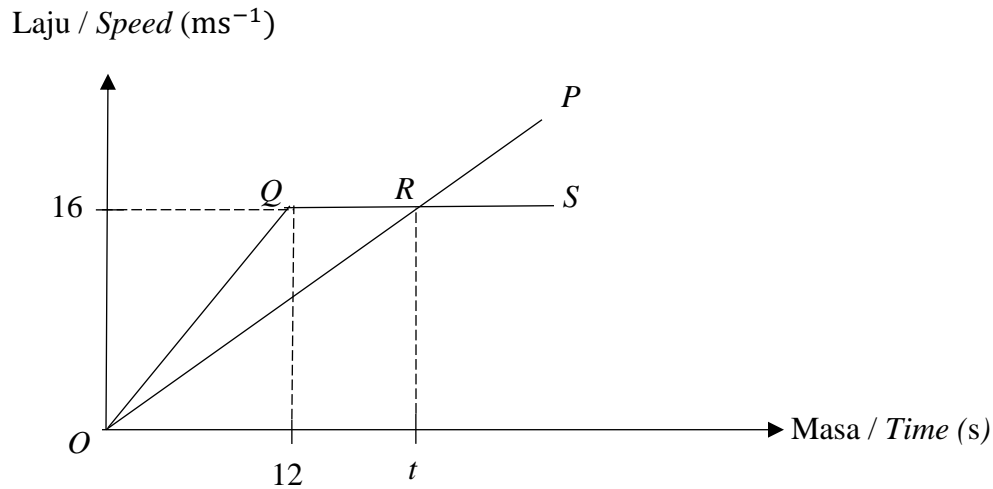
Jawapan/Answer:

(a)

(b)

9. Dalam rajah 3 di bawah, graf OP mewakili Gerakan zarah H manakala graf $OQRS$ mewakili zarah K dalam tempoh t saat.

In the diagram 3 below, the graph OP represents the motion of particle H while the graph $OQRS$ represents the motion of particle K for a period of t seconds.



Rajah 3 / Diagram 3

- (a) Nyatakan laju seragam, dalam ms^{-1} , bagi zarah K .

State the uniform speed, in ms^{-1} , of the particle K .

- (b) Pada t saat, beza antara jarak yang dilalui oleh zarah H dan zarah K ialah 24 m. Hitung nilai t .

In t seconds, the difference in distance travelled between particle H and K is 24 m.

Calculate the value of t .

[4 markah / 4 marks]

Jawapan/Answer:

(a)

(b)

10. Tulis persamaan linear serentak berikut dalam bentuk persamaan matriks.

Write the following simultaneous linear equations as a matrix equation.

$$8m + 3n = 4$$

$$-3m - 2n = -5$$

Seterusnya, dengan menggunakan kaedah matriks, hitung nilai m dan nilai n .

Hence, using matrix method, calculate the value of m and n .

[4 markah / 4 marks]

Jawapan/Answer:

(a)

(b)

Bahagian B

Section B

[45 markah]

[45 marks]

Jawab **semua** soalan dalam bahagian ini.

*Answer **all** questions in this section*

11. Encik Adam ingin membeli x beras jenis A dan y beras jenis B untuk didermakan kepada pihak yang terkesan di sebuah kawasan semasa perintah kawalan pergerakan. Pembelian beras adalah berdasarkan syarat- syarat berikut.

Mr Adam wants to buy x type A rice and y type B rice to donate who which is affected in an area during the movement control order. The purchase of rice is based on the following requirements.

- i) Jumlah kedua-dua jenis beras tersebut selebih-lebihnya 250 unit.

Total number of rices is at most 250 unit

- ii) bilangan beras jenis B adalah sekurang- kurangnya dua kali ganda bilangan beras jenis A .

Total of type B rice is at least two times number of type A rice.

- a) Tulis dua ketaksamaan linear selain $x \geq 0$ dan $y \geq 0$ yang mewakili semua syarat di atas.

Write two linear inequalities, other than $x \geq 0$ and $y \geq 0$ which represent all the above requirements.

[2 markah]

[2 marks]

- b) Lukis dan lorek rantau yang memuaskan sistem ketaksamaan linear di atas.

Draw and shade the region that satisfy the above linear inequality system.

[4 markah]

[4 marks]

- c) Daripada graf, tentukan bilangan maksimum beras jenis B yang dibeli.

From graph, determine the maximum number of type B rice purchase.

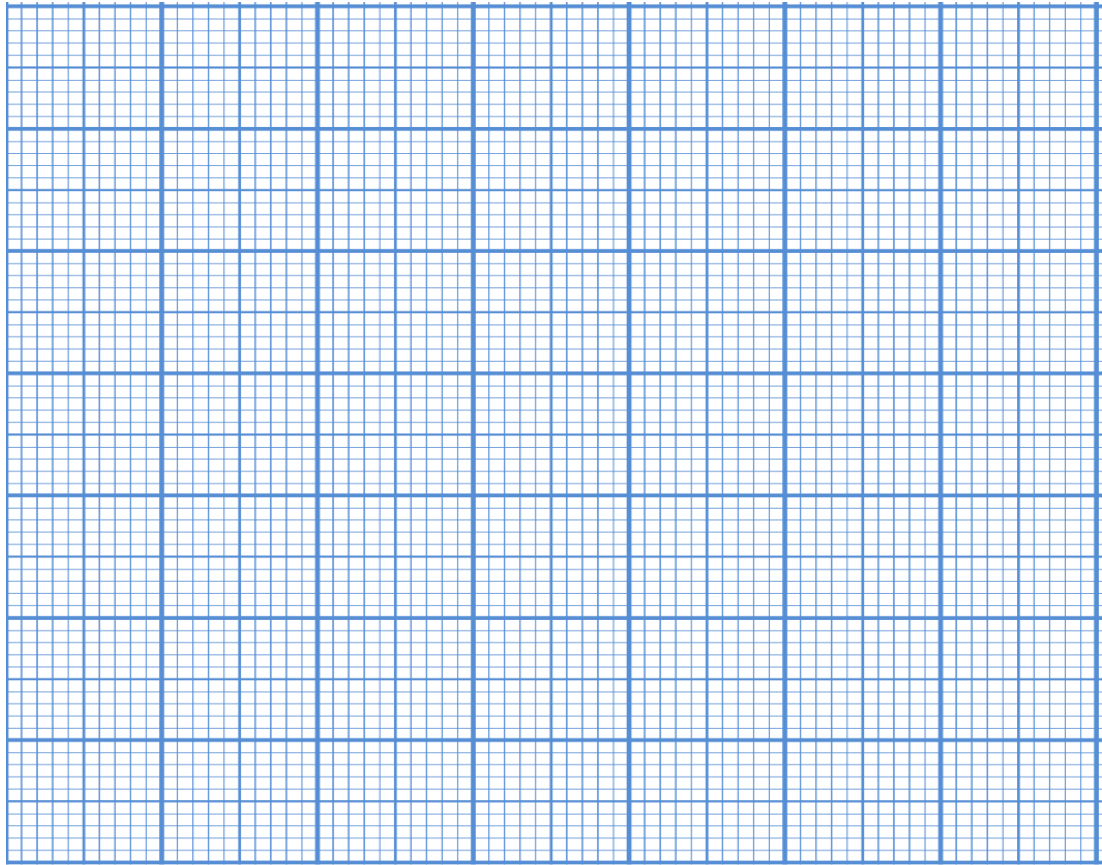
[1 markah]

[1 marks]

Jawapan/*Answer* :

a)

b)



c)

12. Jadual di bawah menunjukkan markah kuiz matematik bagi dua buah kelas .

The table shows the mathematics quiz marks of two classes.

Markah/ Marks	55-59	60-64	65-69	70-74	75-79	80-84
Kelas Budiman <i>Budiman Class</i>	4	6	5	4	4	2
Kelas Jujur <i>Jujur Class</i>	3	7	8	3	3	1

i) Lengkapkan jadual di ruangan jawapan dan hitungkan min dan sisihan piawai bagi data itu.

Complete the table in answer space and calculate the mean and standard deviation of the data.

[8 markah/8 marks]

ii) Kelas manakah yang menunjukkan prestasi yang konsisten ? Berikan justifikasi anda.

Which class performance is more consistent ? Give your justification.

[2 markah/2 marks]

Jawapan/ Answer:

i) Kelas Budiman/ *Budiman Class*

Markah/ Marks	Kekerapan(f)/ frequency(f)	Titik Tengah(x) / Midpoint(x)	fx	x^2	fx^2
55-59	4				
60-64	6				
65-69	5				
70-74	4				
75-79	4				
80-84	2				
	$\Sigma f =$		$\Sigma fx =$		$\Sigma fx^2 =$

Min / Mean:

Sisihan piawai / Standard deviation:

Kelas Jujur/ *Jujur Class*

Markah / <i>Marks</i>	Kekerapan(f)/ <i>Frequency (f)</i>	Titik Tengah(x)/ <i>Midpoint (x)</i>	fx	x^2	fx^2
55-59	3				
60-64	7				
65-69	8				
70-74	3				
75-79	3				
80-84	1				
	$\Sigma f =$		$\Sigma fx =$		$\Sigma fx^2 =$

Min / *Mean*:

Sisihan piawai / *Standard deviation*:

ii)

- 13a) Transformasi V ialah translasi $\begin{pmatrix} -2 \\ -2 \end{pmatrix}$, transformasi W ialah putaran 90° lawan arah jam pada pusat $(0, -1)$ dan transformasi T ialah pantulan pada garis $y = 3$.

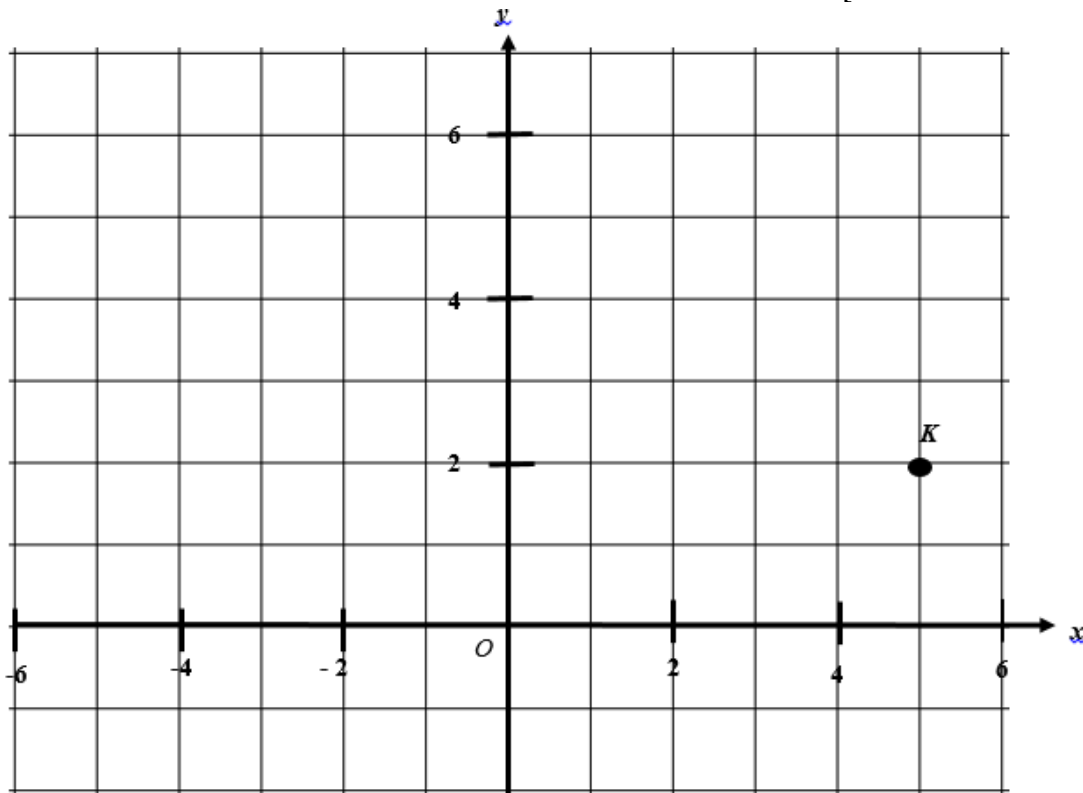
Transformation V is a translation $\begin{pmatrix} -2 \\ -2 \end{pmatrix}$, transformation W is an anticlockwise rotation of 90° about the centre $(0, -1)$ and transformation T is a reflection at the line $y = 3$.

Pada rajah 4.1, tentukan koordinat imej bagi titik K di bawah setiap gabungan transformasi berikut:

At the diagram 4.1, state the coordinate of the image of point K under each of the combined transformation.

- i) WV
- ii) VT

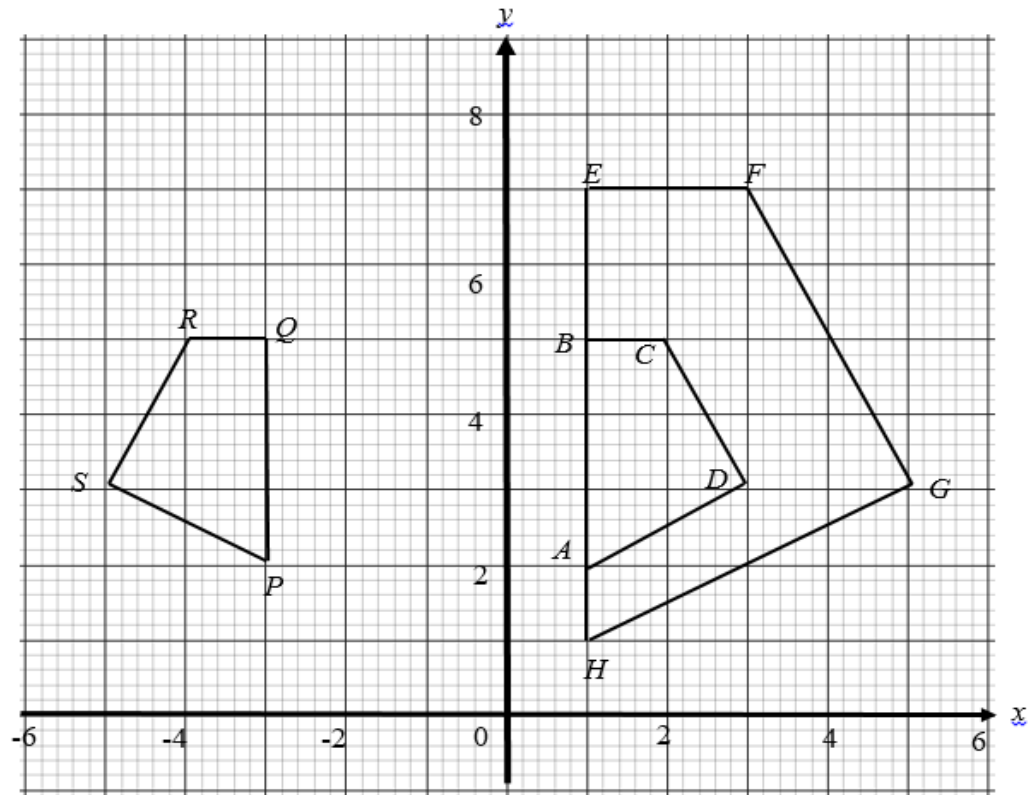
[4 markah/4 marks]



Rajah 4.1 / Diagram 4.1

b) Rajah 4.2 menunjukkan tiga sisi empat $PQRS$, $ABCD$ dan $EFGH$.

The diagram 4.2 shows quadrilateral $PQRS$, $ABCD$ and $EFGH$.



Rajah 4.2/Diagram 4.2

$EFGH$ ialah imej bagi $PQRS$ di bawah gabungan transformasi **RS**

*$EFGH$ is the image of $PQRS$ under the combined transformation **RS***

Perihalkan transformasi

Describe the transformation

i) **S**

ii) **R**

[5 markah/5marks]

Jawapan/answer:

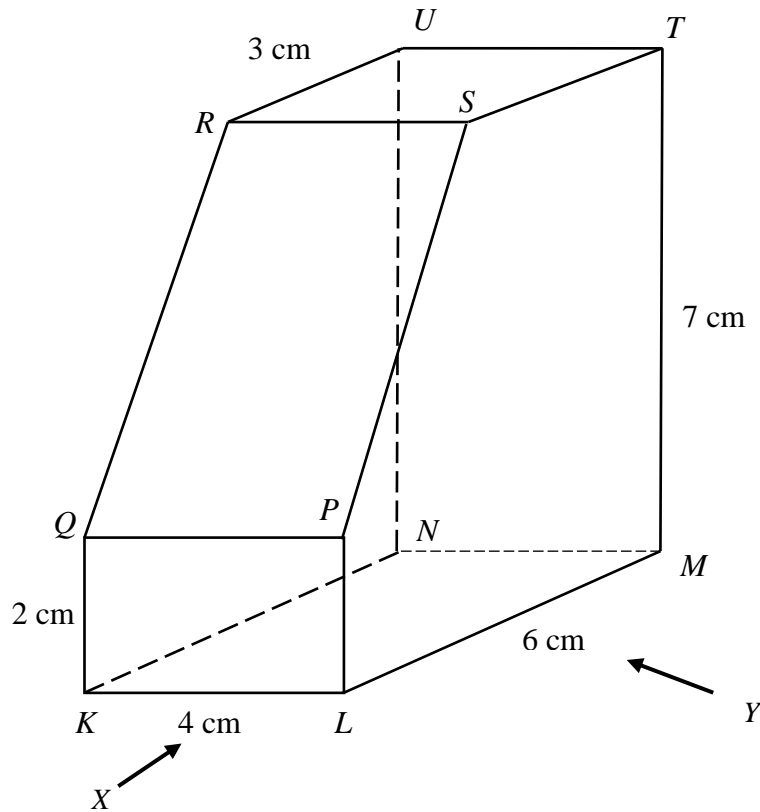
a) i)

ii)

b) i) **S**:

ii) **R**:

- Diagram 5 shows a solid right prism with a rectangular base $KLMN$ on a horizontal table. The surface $LMTSP$ is the uniform cross-section of the prism. Rectangle $QPSR$ is an inclined plane and the rectangular $RSTU$ is a horizontal plane. LP and MT are vertical edges.



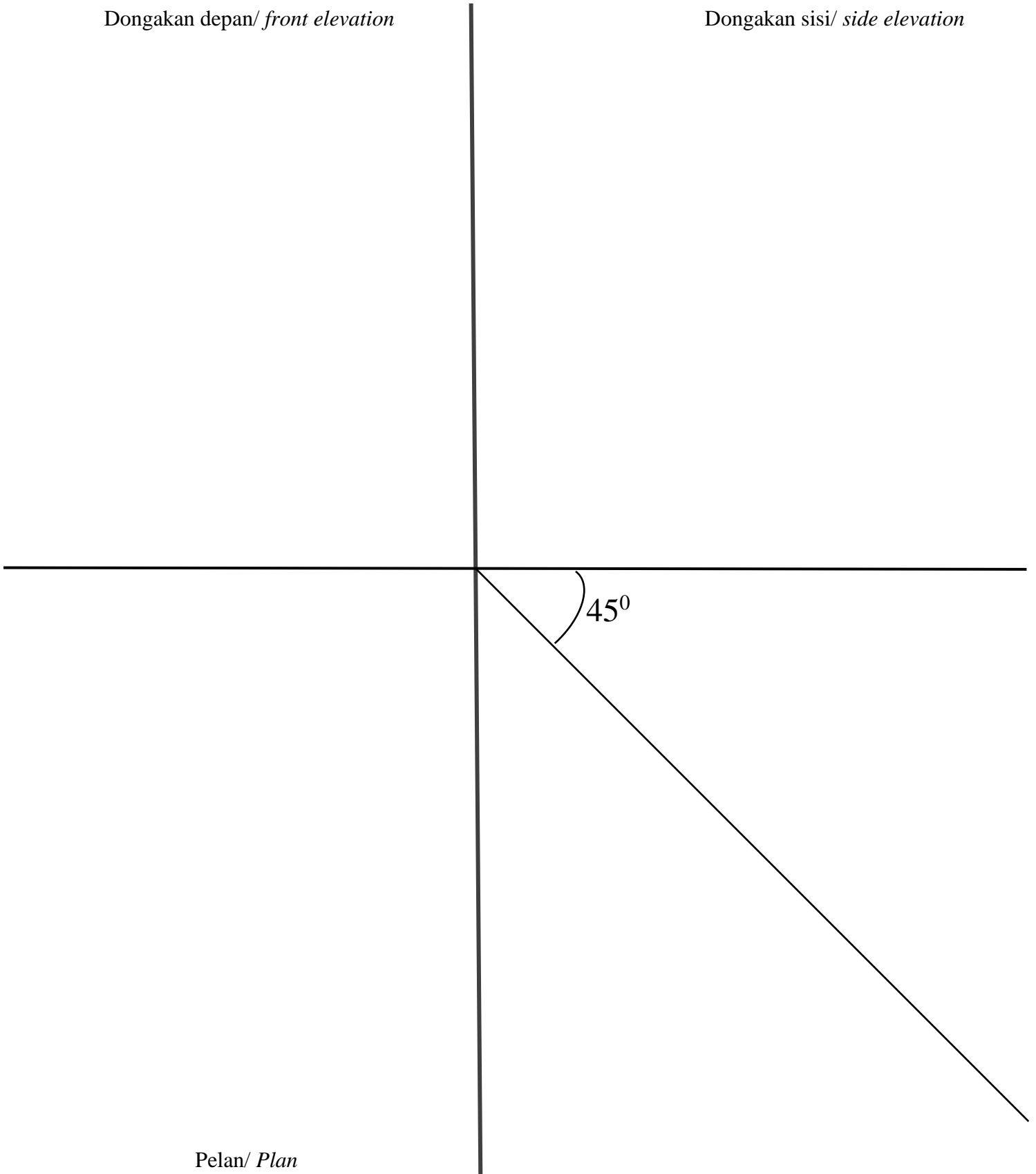
Lukis dengan skala penuh ,
Draw full scale,

- a) pelan objek
the plan of the object. [3 markah/3 marks]
- b) dongakan objek dari arah X
the elevation of the object as viewed from X [3 markah/3 marks]
- c) dongakan objek dari arah Y
the elevation of the object as viewed from Y [4 markah/4 marks]

Jawapan/*Answer*:

Dongakan depan/ *front elevation*

Dongakan sisi/ *side elevation*



Pelan/ *Plan*

15. Pendapatan tahunan Puan Fatimah ialah RM 86 500 pada tahun 2020. Dia menuntut pelepasan cukai bagi individu sebanyak RM 9 000, insurans hayat dan KWSP sebanyak RM 7 000, gaya hidup sebanyak RM1 500, insurans perubatan sebanyak RM 2 500, perbelanjaan rawatan perubatan ibu bapa sebanyak RM 2 200 dan seorang anak berumur 18 tahun ke bawah yang belum berkahwin sebanyak RM 2 000. Puan Fatimah telah membuat bayaran zakat sebanyak RM 600 pada tahun tersebut.

Mrs Fatimah's annual income is RM86 500 in 2020. She is claiming individual tax relief of RM9 000, life insurance and EPF exemption of RM7 000, lifestyle exemption of RM1 500, medical insurance exemption of RM2 500, parent's medical treatment expenses of RM2 200 and unmarried child aged 18 years below exemption of RM2 000. Puan Fatimah made a zakat payment of RM600 on that year.

Banjaran Pendapatan Bercukai / Income tax (RM)	Pengiraan / Calculation (RM)	Kadar / Rate (%)	Cukai / Tax (RM)
50 001-70 000	50 000 pertama <i>First 50 000</i>	14	1800
	20 000 berikutnya <i>Next 20 000</i>		2800

- (a) Hitung pendapatan bercukai bagi Puan Fatimah .
Calculate the chargeable income of Mrs Fatimah.
[3 markah/3marks]
- (b) Hitung cukai pendapatan yang perlu dibayar oleh Puan Fatimah.
Calculate the income tax payment of Mrs Fatimah.
[4 markah/4 marks]
- (c) Jika PCB sebanyak RM230 telah ditolak setiap bulan daripada gajinya, adakah Puan Fatimah perlu membuat bayaran baki cukai pendapatannya. Jelaskan jawapan.
If a monthly tax deduction (PCB) of RM230 is deducted every month from her salary, does Mrs Fatimah have to pay the balance of her income tax. Explain the answer.
[3 markah/3 marks]

Jawapan/ *Answer*:

a)

b)

c)

Bahagian C

Section C

[15 markah/15 marks]

Jawab mana-mana **satu** soalan dalam bahagian ini.

*Answer any **one** question in this section*

16. Sempena bulan kemerdekaan setiap tahun, Encik Uwais akan pergi ke sebuah negeri di Semenanjung Malaysia untuk membuat satu projek derma kepada sebuah pusat jagaan orang tua. Encik Uwais telah mengumpulkan dana sebanyak RM5 000.

Every year in the month of Independence, Mr Uwais will go to a state in Peninsular Malaysia to make a donation project to an old folks home. Mr Uwais has raised a fund of RM5 000.

- a) Jika Encik Uwais telah menggunakan RM550 untuk kos pengangkutan, apakah peratus wang yang dibelanjakannya dan baki dana yang tinggal ?

If Mr Uwais has used RM550 for transportation cost's. What is the percentage of the money that he spends and the remaining funds?

[2 markah/2 marks]

- b) Encik Uwais ingin menderma di pusat jagaan orang tua dengan membeli 70 helai baju dan seluar. Harga sehelai baju dan sehelai seluar masing-masing ialah RM22.00 dan RM 28.00. Encik Uwais membayar menggunakan 40 peratus dari lebihan baki dari sumbangan dari 16(a). Dengan menggunakan kaedah matriks, cari bilangan baju dan seluar yang didermakan oleh Encik Uwais.

Mr Uwais wants to donate to the old folks home by buying 70 pieces shirts and pants. The price of a shirt and a pair of pants is RM22.00 and RM28.00 respectively. Mr Uwais pays using 40 percent of the remaining funds from 16(a). By using the matrix method, find the number of shirts and pants donated by Encik Uwais.

[5 markah/5 marks]

- c) Setelah En Uwais menderma di sebuah pusat jagaan orang tua di sebuah negeri, dia kemudiannya telah pergi ke sebuah daerah di Johor dan menginap di Pasir Gudang. Dia ingin meneruskan aktiviti menderma di pusat jagaan orang tua Seri Kenangan, Johor Bahru. Dari Pasir Gudang, dia melalui Bandar Seri Alam ke Johor Jaya menuju ke Kampung Melayu Majidee dan sampai ke Pusat Seri Kenangan, Larkin, Johor.

Lengkapkan laluan perjalanan Encik Uwais pada kotak di dalam ruang jawapan.

After Mr Uwais donated at an old folks home in a certain state, then he went to the one of the districts in Johor and stayed in Pasir Gudang. He wants to continue his donating activities at the Seri Kenangan old folks home in Johor Bahru. From Pasir Gudang, he passed through Bandar Seri Alam to Johor Jaya towards Kampung Melayu Majidee and reached the Seri Kenangan old folks home in Larkin, Johor.

Complete the route of Mr Uwais's journey in the box in the answer space.

[2 markah/2 marks]

- d) Sekembalinya En Uwais ke rumahnya di Kuala Lumpur, dia ingin membeli satu polisi insurans motor dan berikut ialah maklumat kenderaan yang ingin diinsuranskannya.

Right after Mr Uwais returned to his home in Kuala Lumpur, he wants to buy a motor insurance policy and the following are the information of the vehicle he wishes to insure.

Jumlah yang ingin diinsuranskan/ <i>the amount to be insured</i>	: RM 120 000
Umur Kenderaan/ <i>Vehicle age</i>	: 6 tahun
Kapasiti enjin/ <i>engine capacity</i>	: 2400 cc
NCD/NCD	: 45%

Hitung premium tahunan kenderaan tersebut untuk polisi komprehensif.

Calculate the annual premium of the vehicle for a comprehensive policy.

(Kadar Tariff Motor/ *Motor Tariff Rates* : RM372.60)

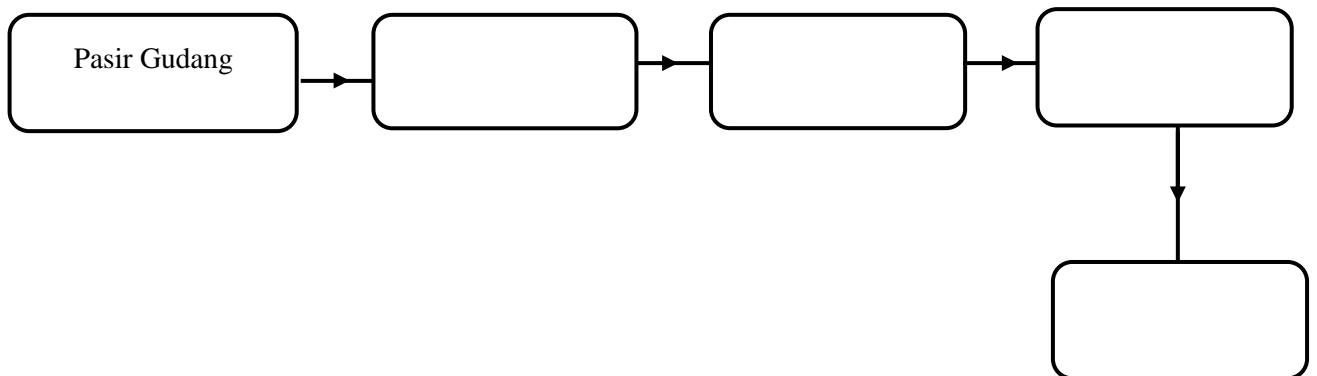
[6 markah/6 marks]

Jawapan/Answer:

a)

b)

c)



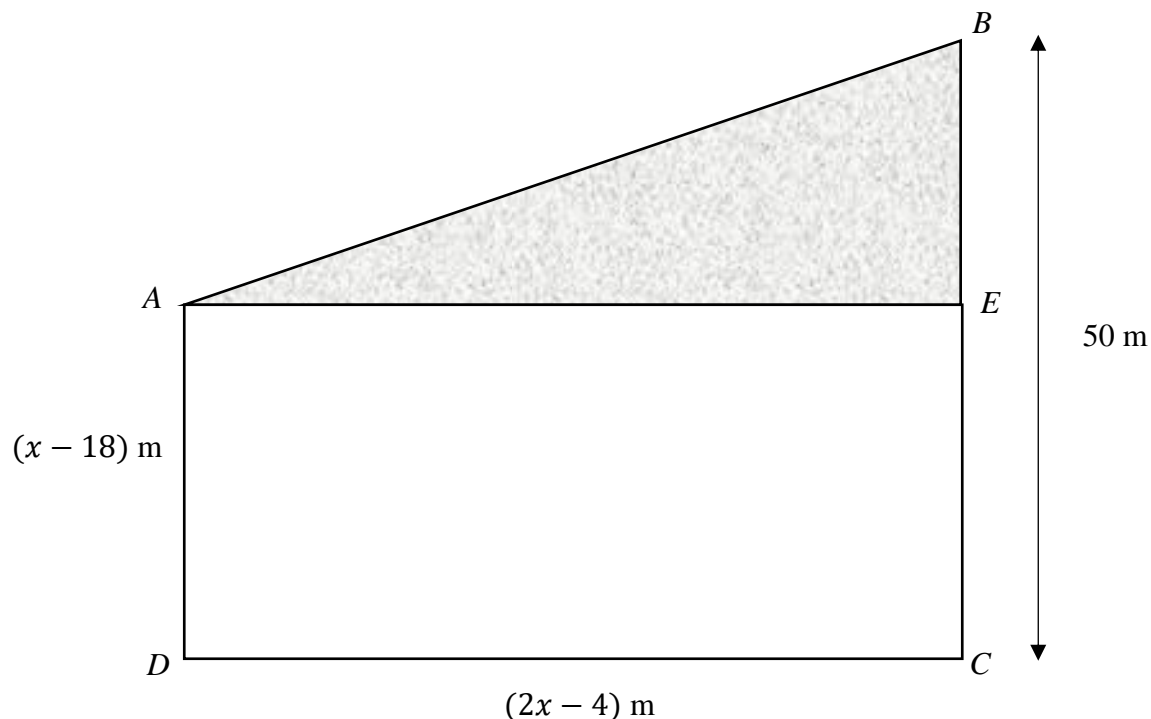
d)

17. Encik Kamaruddin merupakan seorang usahawan berjaya. Beliau berminat untuk membeli satu bidang tanah terbiar di sebuah pekan untuk dijadikan taman rekreasi.

Mr. Kamaruddin is a successful entrepreneur. He is interested in buying a plot of vacant land in a town to be used as a recreation park.

Rajah 17 menunjukkan kawasan tanah yang berbentuk trapezium $ABCD$ yang ingin dibeli oleh Encik Kamaruddin. Kawasan segitiga bersudut tepat ABE adalah merupakan kawasan tasik dengan keadaan $BE : EC = 2 : 3$.

The Diagram 17 shows the area of land in the shape of a trapezium $ABCD$ that Mr. Kamaruddin wants to buy. The right-angle-triangle ABE area is a lake area with condition $BE : EC = 2 : 3$.



Rajah 6 / Diagram 6

- (a) (i) Cari panjang sisi BE tanah tersebut.
Find the length of the side BE of the land.
- (ii) Bentukkan satu ungkapan kuadratik bagi luas keseluruhan kawasan tanah berbentuk trapezium tersebut, $L \text{ m}^2$, dalam sebutan x .
Construct a quadratic expression for the total area of the trapezium land, $L \text{ m}^2$, in terms of x .
- (iii) Diberi luas kawasan berlorek ialah $1\,000 \text{ m}^2$, hitung nilai x .
Given that the area of the shaded area is $1\,000 \text{ m}^2$, calculate the value of x .

[6 markah / 6 marks]

- (b) Encik Kamaruddin ingin memagar di sepanjang sisi AB dan BE dengan pagar yang berharga RM15 semeter. Beliau mempunyai bajet sebanyak RM3 500 bagi menyiapkan pagar tersebut. Tentukan sama ada bajet tersebut mencukupi atau tidak sekiranya upah pemasangan pagar tersebut adalah $\frac{1}{3}$ daripada jumlah keseluruhan harga pembelian pagar.

Mr. Kamaruddin wants to fence along the side of AB and BE with a fence that costs RM15 per meter. He has a budget of RM3 500 to complete the fence. Determine whether the budget is sufficient or not if the fence installation fee is $\frac{1}{3}$ of the total purchase price of the fence.

[6 markah /6 marks]

- c) Encik Kamaruddin telah membuat pinjaman peribadi sebanyak RM100 000 daripada sebuah bank untuk menjayakan projeknya ini. Diberi bahawa kadar faedah yang dikenakan ialah 5% setahun. Hitung bayaran ansuran bulanan Encik Kamaruddin jika tempoh pinjaman ialah 9 tahun.

Mr. Kamaruddin has made a personal loan of RM100 000 from a bank to make this project a success. It is given that the interest rate is 5% per annum. Calculate the monthly instalment of Mr. Kamaruddin if the loan period is 9 years.

[3 markah / 3 marks]

KERTAS SOALAN TAMAT

MAKLUMAT UNTUK CALON

1. Kertas soalan ini mengandungi tiga bahagian: **Bahagian A** , **Bahagian B** dan **Bahagian C**.
2. Jawab **semua** soalan daripada **Bahagian A** dan **Bahagian B** dan 1 soalan daripada **Bahagian C**.
3. Jawapan hendaklah ditulis dengan jelas dalam ruang yang disediakan dalam kertas soalan.
4. Tunjukkan langkah-langkah penting. Ini boleh membantu anda untuk mendapatkan markah.
5. Sekiranya anda hendak menukarkan jawapan, batalkan jawapan itu. Kemudian tuliskan jawapan yang baru.
6. Rajah yang mengiringi soalan tidak dilukiskan mengikut skala kecuali dinyatakan.
7. Markah yang diperuntukkan bagi setiap soalan dan ceraian soalan ditunjukkan dalam kurungan.
8. Satu senarai rumus disediakan di halaman 2 dan 3 .
9. Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.
10. Kertas soalan ini hendaklah diserahkan di akhir peperiksaan.

INFORMATION FOR CANDIDATES

1. This question paper consists of two section : **Sections A**, **Sections B** and **Sections C** .
2. Answer **all** questions question in **Sections A** and **Sections B** and 1 questions in **Sections C**.
3. Write your answers clearly in the spaces provided in the question paper
4. Show your working. It may help your to get marks.
5. If you wish to change your answer, neatly cross out the answer that you have done. Then write down new answer.
6. The diagrams in the questions provided are not drawn to scale unless stated.
7. The marks allocated for each question and sub-part of a question are shown in brackets.
8. A list of formulae is provided on pages 2 and 3.
9. You may use a non-programmable scientific calculator.
10. This question paper must be handed in at the end of the examination.

1449/1

Matematik

Kertas 1

2021

$1\frac{1}{4}$ jam



MODUL ULANGKAJI BERFOKUS SPM 2021

SET 2

MATEMATIK

Kertas 1

Satu jam lima belas minit

PERATURAN PEMARKAHAN SET 2 MODUL BERFOKUS 2021

MODUL ULANGKAJI BERFOKUS SPM 2021

SET 2

MATEMATIK 1449/1

JAWAPAN

No. Soalan	Jawapan	No. Soalan	Jawapan	No. Soalan	Jawapan	No. Soalan	Jawapan
1	B	11	B	21	D	31	C
2	C	12	C	22	B	32	C
3	D	13	D	23	C	33	A
4	B	14	C	24	B	34	D
5	A	15	D	25	A	35	D
6	D	16	B	26	D	36	C
7	C	17	B	27	C	37	A
8	C	18	C	28	A	38	B
9	D	19	D	29	B	39	C
10	A	20	D	30	D	40	A

SULIT
1449/2
Matematik
Kertas2
Peraturan
Pemarkahan
Oktober
2021

SKEMA MODUL KECEMERLANGAN BERFOKUS SET 2 2021

MATEMATIK

Kertas 2

PERATURAN PEMARKAHAN

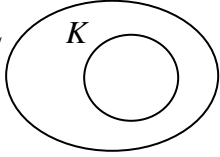
Peraturan pemarkahan ini mengandungi 11 halaman bercetak

[Lihat sebelah

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1449/2

SULIT
SULIT

Bahagian A
[40 markah]

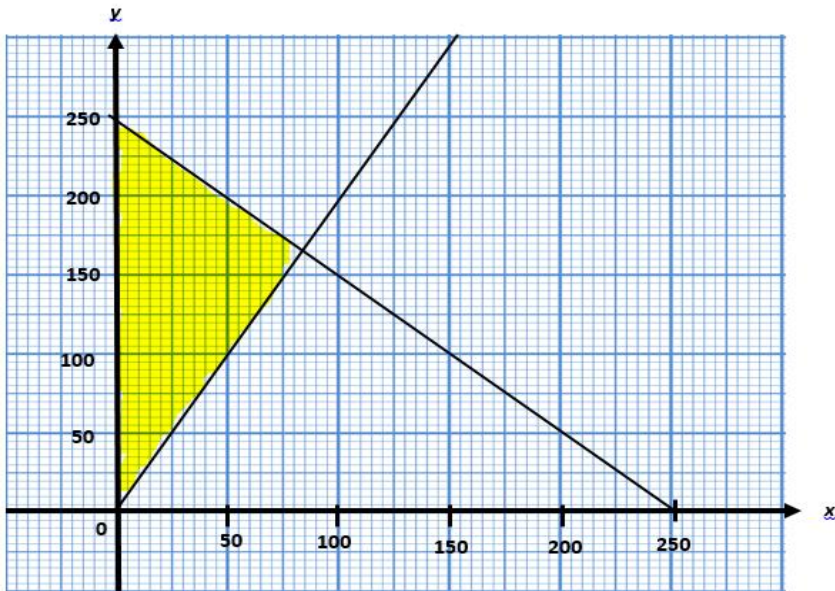
No	Peraturan Pemarkahan	Markah	
1.	a) $\{1\}, \{4\}, \{9\}, \{1,4\}, \{1,9\}, \{4,9\}, \{1,4,9\}, \{ \}$ b) 	1 1 1	3
2	$9x + 7y = 310$ atau $5x + 8y = 275$ $37y = 925$ y (biskut badam) = 25 atau x (Biskut coklat) = 15 RM210	1 1 1 1	4
3	$2x^2 - 3x - 5 = 0$ $(2x - 5)(x + 1) = 0$ $x = 5/2$ $x = -1$	1 1 1 1	4
4	$GF = \sqrt{(10^2 - 6^2)}$ $GF = 8 \text{ cm}$ $[22/7 \times 5^2] - [1/2 \times 6 \times 8]$ 54.57 (2tp)	1 1 1	3
5	$2 \times 22/7 \times 3.5 \times 10 = 220$ 220×10 $\frac{2200}{100}$ 22	1 1 1 1	4

No	Peraturan Pemarkahan	Markah	
6	(a) $x = 3$ (b) $-4 = -2(10) + c$ $c = 16$ $y = -2x + 16$ $0 = -2x + 16$ Pintasan- $x = 8$	1 1 1 1	4
7	(a) Palsu (b) Implikasi 1: Jika 20% daripada 30 ialah 6, maka $0.2 \times 30 = 6$ Implikasi 2: Jika $0.2 \times 30 = 6$, maka 20% daripada 30 ialah 6 (c) $4n^2 + 8$, di mana $n = 1, 2, 3, 4, \dots$	1 1 1 1, 1	5
8	a) $\left[\left(\frac{x}{x+3} \right) \times \left(\frac{8}{12} \right) \right] + \left[\left(\frac{3}{x+3} \right) \times \left(\frac{4}{12} \right) \right] = \frac{13}{24}$ $x = 5$ b) $\left(\frac{5}{8} \times \frac{4}{12} \right) \text{ or } \left(\frac{5}{8} \times \frac{8}{12} \right) \text{ or } \left(\frac{3}{8} \times \frac{4}{12} \right)$ $\left(\frac{5}{8} \times \frac{4}{12} \right) + \left(\frac{5}{8} \times \frac{8}{12} \right) + \left(\frac{3}{8} \times \frac{4}{12} \right)$ $\frac{3}{4}$	1 1 1 1 1	5
9	a) $16ms^{-1}$ b) $\frac{1}{2}(t-12+t)16$ $\frac{1}{2}(t-12+t)16 - \frac{1}{2}(16)t = 24$ $t = 15$	1 1 1 1	4

No	Peraturan Pemarkahan	Markah	
10	$\begin{pmatrix} 8 & 3 \\ -3 & -2 \end{pmatrix} \begin{pmatrix} m \\ n \end{pmatrix} = \begin{pmatrix} 4 \\ -5 \end{pmatrix}$ $\begin{pmatrix} m \\ n \end{pmatrix} = \frac{1}{(8)(-2) - (3)(-3)} \begin{pmatrix} -2 & -3 \\ 3 & 8 \end{pmatrix} \begin{pmatrix} 4 \\ -5 \end{pmatrix}$ $m = -1$ $n = 4$	1 1 1 1	4

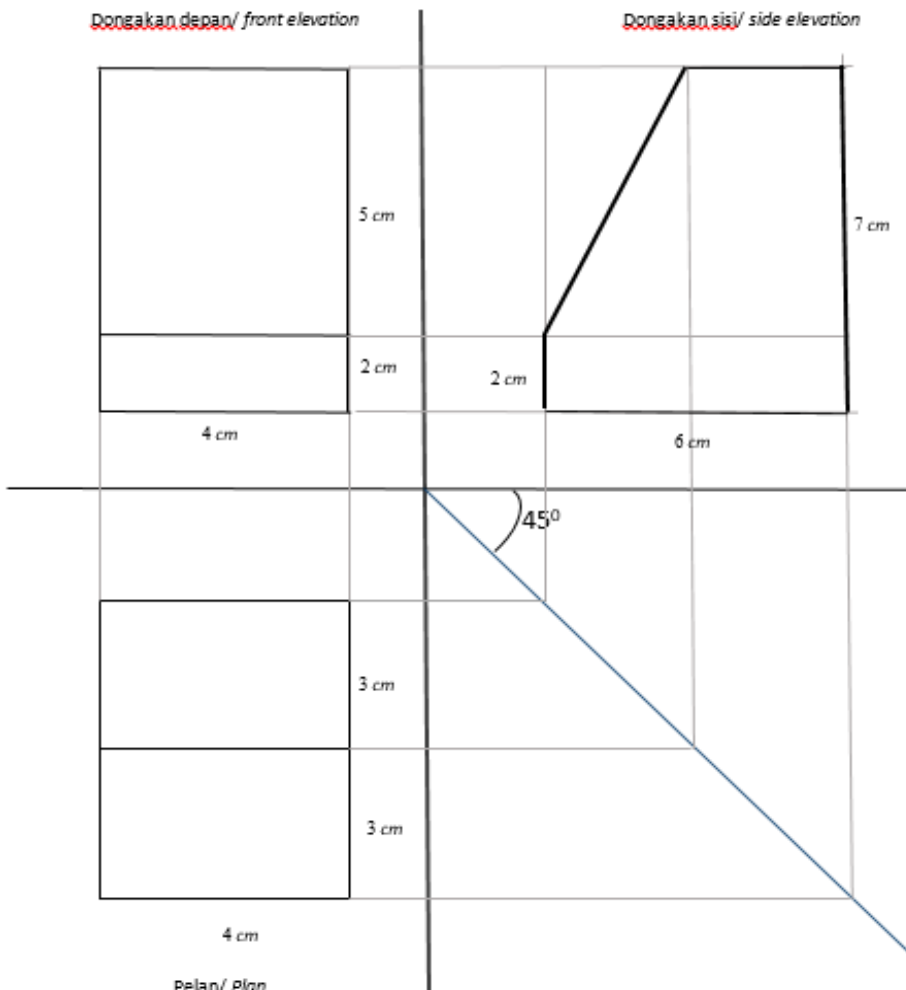
Bahagian B
[45 markah]

No	Peraturan Pemarkahan	Markah	
11	a) $x + y \leq 250$ $y \geq 2x$ b)	1 1	

No	Peraturan Pemarkahan	Markah																																																	
	<div></div> <p>c) 85</p>	1 1 1 1 1	7																																																
12	<p>i) Kelas Budiman/ <i>Budiman Class</i></p> <table><tr><th>Markah/ Marks</th><th>Kekerapan/ Frequency (f)</th><th>Titik Tengah/ Midpoint (x)</th><th>fx</th><th>x^2</th><th>fx^2</th></tr><tr><td>55-59</td><td>4</td><td>57</td><td>228</td><td>3249</td><td>12996</td></tr><tr><td>60-64</td><td>6</td><td>62</td><td>372</td><td>3844</td><td>23064</td></tr><tr><td>65-69</td><td>5</td><td>67</td><td>335</td><td>4489</td><td>22445</td></tr><tr><td>70-74</td><td>4</td><td>72</td><td>288</td><td>5184</td><td>20736</td></tr><tr><td>75-79</td><td>4</td><td>77</td><td>308</td><td>5929</td><td>23716</td></tr><tr><td>80-84</td><td>2</td><td>82</td><td>164</td><td>6724</td><td>13448</td></tr><tr><td colspan="2">$\Sigma f=25$</td><td></td><td>$\Sigma fx=$ 1695</td><td></td><td>$\Sigma fx^2=$ 116405</td></tr></table> <p>Min , $\frac{\Sigma fx}{\Sigma f} = \frac{1695}{25}$ =67.8</p> <p>Sisihan piawai: $\sqrt{\frac{\Sigma fx^2}{\Sigma f} - \overline{x}^2}$ $= \sqrt{\frac{116405}{25} - \left(\frac{1695}{25}\right)^2}$ =7.70</p>	Markah/ Marks	Kekerapan/ Frequency (f)	Titik Tengah/ Midpoint (x)	fx	x^2	fx^2	55-59	4	57	228	3249	12996	60-64	6	62	372	3844	23064	65-69	5	67	335	4489	22445	70-74	4	72	288	5184	20736	75-79	4	77	308	5929	23716	80-84	2	82	164	6724	13448	$\Sigma f=25$			$\Sigma fx=$ 1695		$\Sigma fx^2=$ 116405	1 1 1 1	10
Markah/ Marks	Kekerapan/ Frequency (f)	Titik Tengah/ Midpoint (x)	fx	x^2	fx^2																																														
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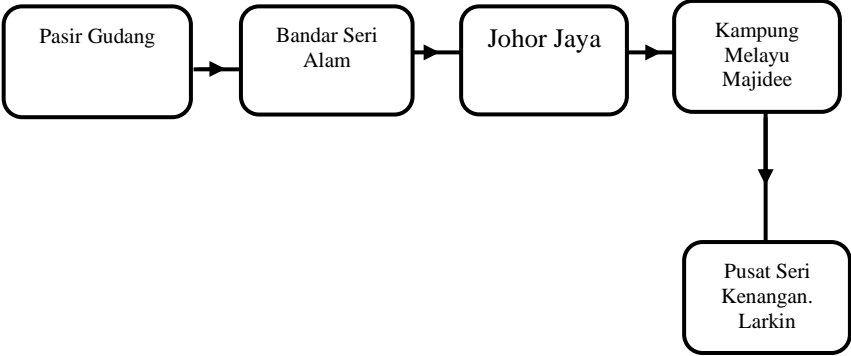
No	Peraturan Pemarkahan	Markah																																																
13.	Kelas Jujur/ <i>Jujur Class</i>																																																	
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a) i) (3, 0) \longrightarrow (-1,2) b) ii) (5, 4) \longrightarrow (3 ,2) b)i)	1																																																	
S : Pantulan, pada garis x=-1 S : Reflection at the line x=-1	1																																																	
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R : Pembesaran, Faktor skala, 2 pada pusat (1,3) R: Enlargement, Scale factor, 2 at the centre (1,3)	1																																																	
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9

No	Peraturan Pemarkahan	Markah	
14.	 <p>Pelan: Bentuk betul dengan empat segiempat tepat . $LM > PS = ST < TU = RS$ Semua ukuran betul ± 0.2 cm dan sudut dibucu segi empat tepat $90^\circ \pm$</p> <p>Dongakan Depan : Bentuk betul dengan empat segiempat tepat KLPQ dan PQRS $LP < PS > RS = QP$ Semua ukuran betul ± 0.2 cm dan sudut dibucu segi empat tepat $90^\circ \pm$</p> <p>Dongakan Sisi: Bentuk betul LPSTM $LP < PS > ST < TM < LM$ Semua ukuran betul ± 0.2 cm dan sudut dibucu tepat $90^\circ \pm$ Ketiga-tiga Lukisan menggunakan sudut 45°</p>	1 1 1 1 1 1 1 1 1 1 1 1 1 1	10
15.	<p>a) $RM86\,500 - [RM9000 + RM7000 + RM1500 + RM2500 + RM2200 + RM2000]$</p> <p>Pendapatan Bercukai = RM 62 300</p> <p>b) Cukai pendapatan $(RM6\,2300 - RM50\,000) \times 14\%$ = RM1722.00</p> <p>RM1722 + RM1800(Cukai dasar) – RM 600(Zakat)</p>	1 1 1 1 1	9

No	Peraturan Pemarkahan	Markah	
	<p>= RM 2922.00</p> <p>c) $RM230 \times 12 = RM 2760$ $RM2922 - RM2760$ $= RM 162$</p> <p>Puan Fatimah perlu membuat bayaran sebanyak RM162 kepada LHDN kerana jumlah PCB yang dipotong tidak mencukupi untuk cukai pendapatan yang perlu dibayarnya.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>	

Bahagian C
[15 markah]
[15 marks]

No	Peraturan Pemarkahan	Markah	
16a)	11% RM4450	1 1	2
b)	$x + y = 70 @$ $22x + 28y = 1780$ $\begin{pmatrix} 1 & 1 \\ 22 & 28 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 70 \\ 1780 \end{pmatrix}$ $\begin{pmatrix} x \\ y \end{pmatrix} = \frac{1}{1(28) - 1(22)} \begin{pmatrix} 28 & -1 \\ -22 & 1 \end{pmatrix} \begin{pmatrix} 70 \\ 1780 \end{pmatrix} @ setara$ $\begin{pmatrix} x \\ y \end{pmatrix} = \frac{1}{6} \begin{pmatrix} 28(70) & + (-1(1780)) \\ -22(70) & + 1(1780) \end{pmatrix} @ setara$ (jalan kerja yang mesti ditunjukkan) $\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 30 \\ 40 \end{pmatrix}$ <i>Baju, $x = 30$</i> <i>Seluar $y = 40$</i>	1 1 1 1 1	5
c)	 <pre> graph LR A[Pasir Gudang] --> B[Bandar Seri Alam] B --> C[Johor Jaya] C --> D[Kampung Melayu Majidee] D --> E[Pusat Seri Kenangan. Larkin] </pre>	1 1	2

No	Peraturan Pemarkahan	Markah	
d)	<p>Polisi Komprehensif</p> <p>a) 1000 pertama = RM 372.60</p> <p>b) Jumlah diinsurankan=</p> $= \text{RM}26 \times \frac{120000 - 1000}{1000}$ <p>= RM3094.00</p> <p>c) Premium asas= RM 372.60+ RM3094.00 = RM3466.60</p> <p>d) NCD = 45% ×RM3466.60 = RM1559.97</p> <p>e) Premium Kasar = RM3466.60-RM1559.97</p> <p>= RM1906.63</p>	1 1 1 1 1 1	
	JUMLAH MARKAH	15	

No	Peraturan Pemarkahan	Markah
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No	Peraturan Pemarkahan	Markah	
17 a)	(i) 20 m (ii) $\frac{1}{2} \times [(x - 18) + 50] \times (2x - 4)$ $x^2 + 30x - 64$ (iii) $\frac{1}{2} \times 20 \times (2x - 4) = 1000$ $20x = 1040$ $x = 52$	1 1 1 1 1 1	6
17 b)	$PQ = \sqrt{100^2 + 20^2}$ $= 102$ Panjang AB + BE $= 102 + 20$ $= 122$ $122 \times \text{RM}15$ $= \text{RM}1830$ $1830 + [\frac{1}{3} \times 1830]$ $= \text{RM}2440$ Mencukupi	1 1 1 1 1	6

No	Peraturan Pemarkahan	Markah	
17 c)	$100\,000 + (100\,000 \times 0.05 \times 9)$ $= \text{RM}145\,000$ $\frac{145\,000}{9 \times 12}$ $\text{RM } 1342.59$	1 1 1	3
	JUMLAH MARKAH	15	